



Dell Dimension® XPS Rxxx Systems

**REFERENCE AND  
TROUBLESHOOTING  
GUIDE**







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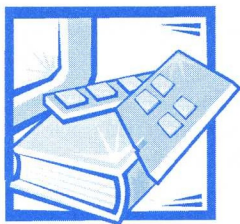
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## Safety Instructions

Use the following safety guidelines to help protect your computer system from potential damage and to ensure your own personal safety.

### When Using Your Computer System

As you use your computer system, observe the following safety guidelines.



**WARNING: Do not operate your computer system with any cover(s) (including computer covers, bezels, filler brackets, front-panel inserts, and so on) removed.**

- To help avoid damaging your computer, be sure the voltage selection switch on the power supply is set to match the AC power available at your location:
  - 115 volts (V)/60 hertz (Hz) in most of North and South America and some Far Eastern countries such as Japan, South Korea, and Taiwan
  - 230 V/50 Hz in most of Europe, the Middle East, and the Far East

Also be sure your monitor and attached devices are electrically rated to operate with the AC power available in your location.

- To help prevent electric shock, plug the computer and device power cables into properly grounded electrical outlets. These cables are equipped with three-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a three-wire cable with properly grounded plugs.
- To help avoid possible damage to the system board, wait 5 seconds after turning off the system before disconnecting a device from the computer.
- To help protect your computer system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Be sure nothing rests on your computer system's cables and that the cables are not located where they can be stepped on or tripped over.
- Do not spill food or liquids on your computer. If the computer gets wet, consult "If Your Computer Gets Wet" in Chapter 6.



- Do not push any objects into the openings of your computer. Doing so can cause fire or electric shock by shorting out interior components.
- Keep your computer away from radiators and heat sources. Also, do not block cooling vents. Avoid placing loose papers underneath your computer; do not place your computer in a closed-in wall unit or on a bed, sofa, or rug.

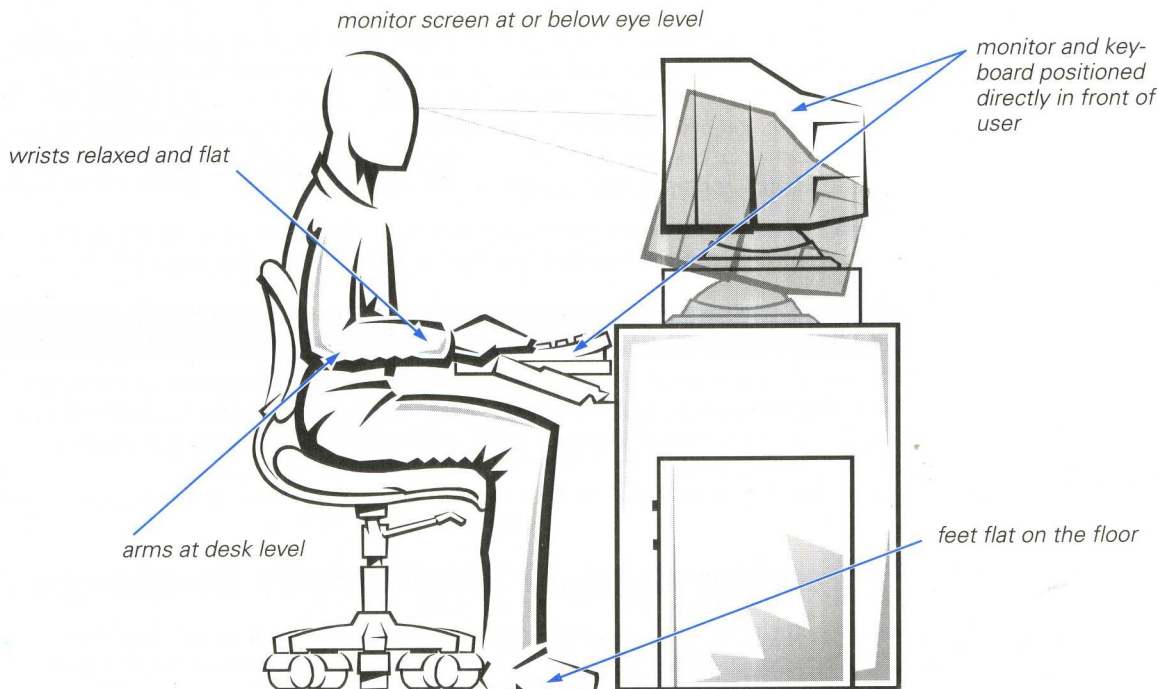
## **Ergonomic Computing Habits**



**WARNING: Improper or prolonged keyboard use may result in injury.**

For comfort and efficiency, observe the following ergonomic guidelines when setting up and using your computer system:

- Position your system so that the monitor and keyboard are directly in front of you as you work. Special shelves are available (from Dell and other sources) to help you correctly position your keyboard.
- Set the monitor at a comfortable viewing distance (usually 510 to 610 millimeters [20 to 24 inches] from your eyes).
- Make sure the monitor screen is at eye level or slightly lower when you are sitting in front of the monitor.
- Adjust the tilt of the monitor, its contrast and brightness settings, and the lighting around you (such as overhead lights, desk lamps, and the curtains or blinds on nearby windows) to minimize reflections and glare on the monitor screen.
- Use a chair that provides good lower back support.
- Keep your forearms horizontal with your wrists in a neutral, comfortable position while using the keyboard or mouse.
- Always leave space to rest your hands while using the keyboard or mouse.
- Let your upper arms hang naturally at your sides.
- Sit erect, with your feet resting on the floor and your thighs level.
- When sitting, make sure the weight of your legs is on your feet and not on the front of your chair seat. Adjust your chair's height or use a footrest, if necessary, to maintain proper posture.
- Vary your work activities. Try to organize your work so that you do not have to type for extended periods of time. When you stop typing, try to do things that use both hands.



## When Working Inside Your Computer

Before you remove the computer cover, perform the following steps in the sequence indicated.



**CAUTION: Do not attempt to service the computer system yourself, except as explained in this guide and elsewhere in Dell documentation. Always follow installation and service instructions closely.**

1. Turn off your computer and any devices.
2. Disconnect your computer and devices from their electrical outlets. Also, disconnect any telephone or telecommunication lines from the computer to reduce the potential for personal injury or shock.

Certain system board components continue to receive power any time the computer is connected to an electrical outlet.

3. Wear a wrist grounding strap or touch an unpainted metal surface on the chassis, such as the power supply bracket, before touching anything inside your computer.

While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components.

In addition, take note of these safety guidelines when appropriate:

- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; to disconnect this type of cable, press in the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, make sure both connectors are correctly oriented and aligned.
- Handle components and cards with care. Don't touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket.

#### **WARNING**

**There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.**

## ***Protecting Against Electrostatic Discharge***

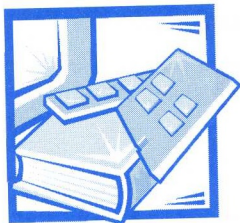
Static electricity can harm delicate components inside your computer. To prevent static damage, discharge static electricity from your body before you touch any of your computer's electronic components, such as expansion cards. You can do so by touching an unpainted metal surface on the computer chassis.

As you continue to work inside the computer, periodically touch an unpainted metal surface to remove any static charge your body may have accumulated. Use of a wrist grounding strap is highly recommended.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- Keep a static-sensitive component in its antistatic packing material until you are ready to install the component in your computer. Just before unwrapping the antistatic packaging, discharge static electricity from your body.
- Transport sensitive components in antistatic containers or packaging.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.





## **Preface**

### **About This Guide**

This guide is intended for anyone who uses a Dell Dimension XPS Rxxx computer system. It can be used by both first-time and experienced computer users who want to maintain, upgrade, or troubleshoot their computers. The chapters and appendixes are summarized as follows:

- Chapter 1, "Introduction," provides an overview of the system features and information on preventative maintenance to protect the computer.
- Chapter 2, "Installing Upgrades on the System Board," provides information on performing various upgrades, such as installing additional memory. The chapter includes a basic orientation to internal features of the computer.
- Chapter 3, "Installing Drives," provides instructions on how to install and remove drives.
- Chapter 4, "Basic Troubleshooting," contains checklists to use before calling Dell for technical assistance.
- Chapter 5, "Software Solutions," has information on reinstalling drivers and the operating system.
- Chapter 6, "Checking Inside Your Computer," presents troubleshooting procedures for system components such as expansion cards, memory, and drives.
- Chapter 7, "Running the Dell Diagnostics," describes the Dell Diagnostics program used to test your computer system.
- Chapter 8, "Getting Help," provides information on obtaining technical assistance. Users who have been unable to resolve problems using the troubleshooting information provided in this guide can refer to this chapter.
- Appendix A, "System Specifications," is supplemental reference material.
- Appendix B, "System Setup Program," describes the system setup program used for checking and changing system configuration data.
- Appendix C, "Beep Codes and System Messages," documents status and error messages generated during system start-up. Included are possible causes and corrective actions.

- Appendix D, "Regulatory Notices," provides regulatory information on the system.
- Appendix E, "Warranty, Return Policy, and Year 2000 Statement of Compliance," describes the warranty for your Dell system and the "Total Satisfaction" Return Policy.

## Warranty and Return Policy Information

Dell Computer Corporation ("Dell") manufactures its hardware products from parts and components that are new or equivalent to new in accordance with industry-standard practices. For information about the Dell warranty for your system, see Appendix E, "Warranty, Return Policy, and Year 2000 Statement of Compliance."

## Other Documents You May Need

Besides this *Reference and Troubleshooting Guide*, the following documentation is included with your system:

- The *Getting Started* sheet provides step-by-step instructions for setting up your computer system.
- The *Dell Dimension XPS Rxxx Systems Setup Guide* contains information necessary to properly configure your system for operation, access the Internet, and use software and hardware. The guide also provides answers to questions that are often asked by Dell computer users.
- The Windows-based *Online Guide* presents in an online format information from the *Setup Guide* and from this guide. This document is located in the **Dell Accessories** folder.

You may also have one or more of the following documents.



*NOTE: Documentation updates are sometimes included with your system to describe changes to your system or software. Always read these updates **before** consulting any other documentation because the updates often contain the latest information.*

- Operating system documentation is included.
- Video card documentation from the card manufacturer describes the video drivers included with the system. Only users who want to change the default video driver or reinstall the video driver need to read this documentation.
- Documentation is included with any options you purchase separately from your system. The documentation contains configuration information and supplements the installation instructions provided in this guide.
- The *Dell Service and Support Plans* is an online reference to Dell's service and support plans, guarantees, and warranties. It applies to the United States only. This document is located in the **Dell Accessories** folder.
- Technical information files—sometimes called "readme" files—may be installed on your hard-disk drive to provide last-minute updates about technical changes to your system or reference material intended for experienced users.

## Notational Conventions

The following subsections describe notational conventions used in this document.

### Warnings, Cautions, and Notes

Throughout this guide, there may be blocks of text indicated by symbols in the page margin and printed in bold type or in italic type. These blocks are warnings, cautions, and notes, and they are used as follows:



**WARNING:** A WARNING indicates the potential for bodily harm and tells you how to avoid the problem.



**CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.



*NOTE:* A NOTE indicates important information that helps you make better use of your computer system.

### Typographical Conventions

The following list defines (where appropriate) and illustrates typographical conventions used as visual cues for specific elements of text throughout this document:

- *Interface components* are window titles, button and icon names, menu names and selections, and other options that appear on the monitor screen. They are presented in bold.  
Example: Click the **Start** button, and then click **Run**.
- *Keycaps* are the labels that appear on the keys on a keyboard. They are enclosed in angle brackets.  
Example: <Enter>
- *Key combinations* are series of keys to be pressed simultaneously (unless otherwise indicated) to perform a single function.  
Example: <Ctrl><Alt><Enter>
- *Commands* presented in lowercase bold are for reference purposes only and are not intended to be typed when referenced.  
Example: "Use the **format** command to . . . ."

In contrast, commands presented in the Courier New font are part of an instruction and intended to be typed.

Example: "Type `format a:` to format the diskette in drive A."

- *Filenames* and *directory names* are presented in lowercase bold.  
Examples: **autoexec.bat** and **c:\windows**



- *Screen text* is a message or text that you are instructed to type as part of a command (referred to as a *command line*). Screen text is presented in the Courier New font.

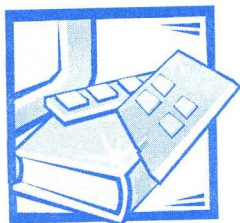
Example: The following message appears on your screen:

No boot device available

Example: "Type md c:\programs and press <Enter>."

- *Variables* are placeholders for which you substitute a value. They are presented in italics.

Example: DIMMx (where x represents the DIMM socket designation).



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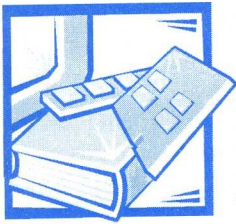
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# CHAPTER 1

## *Introduction*

Dell Dimension® XPS Rxxx computer systems are high-speed personal computers that include an Intel® Pentium® II microprocessor with MMX™ technology. These systems combine high-performance Peripheral Component Interconnect (PCI) design with accelerated graphics port (AGP) and Industry-Standard Architecture (ISA) design, allowing a wide range of initial configurations and upgrade possibilities.

This chapter provides information about the following:

- Major hardware and software features of your computer
- Available upgrades for your computer
- Preventative maintenance procedures to protect your investment and extend the life of your computer.

## **Hardware Features**

Your Dell® computer offers the following hardware features:

- An Intel Pentium II microprocessor that runs at an internal speed of 350, 400, or 450 megahertz (MHz). The microprocessor's external speed of 100 MHz offers a significant performance improvement over processors operating at an external speed of 66 MHz.

The Intel Pentium II microprocessor in your computer includes MMX technology designed to handle complex multimedia and communications software, thereby improving overall system performance.

- Cache memory that enhances the speed of many microprocessor operations by storing the most-recently accessed contents of system memory:
  - A level 1 (L1) cache consisting of 32 kilobytes (KB) of high-speed static random-access memory (SRAM) that resides in the processor core.
  - A level 2 (L2) cache consisting of 512 KB of burst SRAM on a separate chip on the processor card. The L2 cache runs at half the processor's internal clock speed.
- A dedicated graphics bus that significantly enhances 3D graphics performance and supports up to 2X AGP at 133 MHz based on the video card.

- Memory that can be increased up to 384 megabytes (MB) by installing 32-, 64-, or 128-MB synchronous dynamic random-access memory (SDRAM) dual in-line memory modules (DIMMs) in the three DIMM sockets on the system board.
- Full Plug and Play version 1.2a capability in the system basic input/output system (BIOS) allows you to install both PCI and ISA Plug and Play expansion cards without performing manual configuration tasks. The system BIOS is stored in flash memory, so it can be updated to support future Plug and Play enhancements.



*NOTE: The Microsoft® Windows NT® operating system does not provide ISA Plug and Play support. Therefore, some ISA Plug and Play cards may not work with Windows NT unless you configure them manually.*

The system board includes the following built-in features:

- Three full-length 32-bit PCI expansion slots for connecting high-speed PCI devices to the PCI bus—greatly increasing their input/output (I/O) speeds over the speeds attainable using the ISA bus.
- One full-length 16-bit ISA expansion slot.
- One shared full-length PCI/ISA expansion slot containing both a PCI and an ISA expansion-card connector, only one of which can be used at any given time.
- One full-length AGP expansion slot.
- An integrated diskette drive interface that supports a single diskette drive without the need for a controller card.
- Two enhanced integrated drive electronics (EIDE) interfaces on the PCI bus support up to two EIDE devices each. Supported devices include Advanced Technology Attachment (ATA)-33 Ultra direct memory access (DMA) hard-disk drives, CD-ROM drives, and tape drives.



*NOTE: Inconsistencies in the manufacturing of CD-ROM media may cause some higher-speed CD-ROM drives to vibrate more than others. Such vibration and associated noise does not indicate a defect in the drive or the CD.*

- One serial port and one bidirectional parallel port for connecting external devices. Parallel Port Mode in the system setup program sets the parallel port for output-only (AT), bidirectional (Personal System/2 [PS/2]), Extended Capabilities Port (ECP), or Enhanced Parallel Port (EPP) mode. ECP mode, while similar to EPP mode, can enhance the performance of the Microsoft Windows® 98 operating system because it uses DMA to transfer data. Also, ECP uses a first-in first-out (FIFO) buffer for sending or receiving data.



*NOTES: The default setting in the system setup program is **Bi-Directional**.*

*Options that use ECP mode may come with special drivers that must be installed to use this mode.*



- For systems running Windows 98, the two high-performance Universal Serial Bus (USB) ports provide a single connection point for multiple USB-compliant devices. These devices can be connected and disconnected while the system is running.

*NOTE: If you attach a USB device that was not included in your original system configuration, you may need to install a specific driver for that device to obtain its full functionality. Contact the USB device manufacturer for more information.*

- A PS/2-style keyboard port and a PS/2-compatible mouse port.
- Dell Dimension XPS Rxxx systems are available with and without on-board sound. For systems with on-board sound, a PCI/ISA advanced audio controller with 3D positioning and Direct Sound acceleration provides audio functions compatible with a Sound Blaster Pro expansion card. A musical instrument digital interface (MIDI)/game port provides a connection for a joystick, MIDI keypad, game pad, or other game input device.

## Software Features

The following software is included with your Dell computer system:

- Microsoft Windows 98 or Windows NT 4.0 is installed on your hard-disk drive. For more information, refer to your operating system documentation.
- Virus-scanning software for Windows 98.
- Audio utilities for systems with on-board sound.
- The system setup program for viewing and changing system configuration information (refer to Appendix B, "System Setup Program").
- Video drivers provided with the video card installed in your computer for supporting video resolutions greater than 640 x 480 pixels. Before changing the resolution, check the monitor documentation to determine the supported resolutions and refresh rates. Refer to "Video Display" in Chapter 5 of the *Setup Guide* for instructions on changing the resolution.
- The Dell Program Diskette Maker, which allows you to create program diskette sets of software that Dell installed on your computer's hard-disk drive.
- Dell Diagnostics for evaluating the computer's components and devices (refer to Chapter 7, "Running the Dell Diagnostics").

## Available Upgrades

The upgrades Dell offers undergo rigorous testing to ensure proper operation with your computer. You should review "Expansion Card Upgrades" in Chapter 2 or Chapter 3, "Installing Drives," to be sure you have the necessary slots or resources available before purchasing such an upgrade.

Dell offers a variety of expansion cards to increase system functionality:

- High-performance video cards with up to 8 MB of video memory
- 10- and 100-megabit per second (Mbps) network cards



- Small computer system interface (SCSI) host adapter cards
- Fax/modem cards with telephony support
- PCI sound cards and multimedia speakers

You can expand your system's memory up to 384 MB by installing additional 100-MHz SDRAM DIMMs in the DIMM sockets on the system board. Purchasing memory upgrades from Dell Spare Parts ensures system compatibility; these upgrades are also covered under your system warranty. Refer to "Adding Memory" in Chapter 2 before purchasing a memory upgrade.

Dell offers a wide variety of drives that can be installed in your system, including the following:

- ATA-33 Ultra DMA hard-disk drives (4.3 gigabytes [GB] or larger)
- EIDE tape drives in capacities of 4 GB (8 GB compressed) and larger
- Removable Zip drives
- A variety of SCSI devices, including hard-disk drives and CD-ROM drives

To order any of these upgrades, call Dell.

## Preventative Maintenance

The following sections contain maintenance procedures that you should perform regularly to keep the system in top operating condition.

### Preserving Data

Everyone inadvertently deletes files at one time or another, viruses can corrupt files, and hard-disk drives can fail after extended use. To avoid data loss, regularly back up the data files on the hard-disk drive. If you should lose the contents of your hard-disk drive, you can reinstall programs, but your data files will be lost if you do not have a backup.

You should have created program diskette sets for your Dell-installed software during the initial setup of your computer. If you did not, refer to "Making Program Diskette Sets" in Chapter 1 of the *Setup Guide*.



*NOTE: In case of warranty replacement of your hard-disk drive, you receive a blank, formatted drive from Dell. It is your responsibility to reinstall application programs and restore data files.*

### Scheduling Backups

Dell recommends that you back up the hard-disk drive at least once a week, with a daily backup of those files that have been changed. Following these guidelines ensures the loss of no more than a day's work. As further insurance against data loss, keep duplicate copies of the weekly and monthly backups at an off-site location. Doing so ensures that you lose no more than a week's work, even if one of the on-site backups becomes corrupted.

## **Backup Devices**

Tape and Zip drives are convenient and affordable devices that can back up data at rates of up to 1.6 megabytes per second (MB/sec) and can often run unattended. Dell recommends these drives and their associated backup software for use as system backup devices. Depending on how many data files you have, you can also use diskettes as backup devices.

## **Virus-Scanning Software and Data Transfers**

With thousands of known viruses and with the prevalence of data transfers over telecommunications lines, it is important that you use virus-scanning software to protect your computer. Regularly update your virus-scanning software as described in the software documentation and load updates immediately.

It is particularly important to scan before installing any software from unlicensed sources, either downloaded from the Internet or on diskettes. Making regular backups as discussed in the previous section provides insurance in case a virus does infect your system.

## **Cleaning System Components**

As it draws in air to cool the computer, the power supply fan also draws dust and other particles into the computer. This contaminant buildup increases the system's internal temperature and interferes with component operation.

To minimize these conditions, Dell recommends keeping your work environment clean. In particular, you should regularly clean your computer system and use commercially available drive-cleaning kits to remove contaminants inside externally accessible drives.

You may also want to purchase monitor and keyboard covers to protect against dust and debris.

## **Recommended Tools and Accessories**

Use the following tools and accessories for cleaning the computer system:

- Wrist grounding strap to reduce the effects of electrostatic discharge (ESD).
- Liquid dishwashing detergent
- Isopropyl (rubbing) alcohol
- Soft, lint-free cleaning cloth
- Nonabrasive diskette-drive head-cleaning kit that contains pretreated diskettes in individually sealed packages
- CD-ROM drive-cleaning kit
- Small vacuum cleaner with a brush attachment

## *Cleaning the Computer, Monitor, and Keyboard Exteriors*

To clean the exterior of the computer, monitor, and keyboard, follow these steps:

1. Place the strap around your wrist and attach the other end to an unpainted metal surface on the chassis, such as the power supply bracket, that is connected to chassis ground.
2. Turn off the computer, monitor, and any other attached devices, and disconnect them from their power sources.
3. Use the vacuum cleaner to remove any dust from the slots and holes on the computer and between the keys on the keyboard.
4. Moisten a soft cleaning cloth with a solution of three parts water and one part liquid dishwashing detergent.

Do not soak the cloth in the solution; you must not let the solution drip inside the computer or keyboard.



**CAUTION: Do not wipe the monitor screen with this solution. Doing so may damage the antiglare coating on your monitor screen.**

5. Use the moistened cloth to wipe the computer cover, the keyboard, and the exterior of the monitor.

## *Cleaning the Mouse*

If the screen cursor skips or moves abnormally, clean your mouse by following these steps:

1. Turn the retainer ring counterclockwise to remove the ball.
2. Wipe the ball with a clean, lint-free cloth.
3. Blow carefully into the ball cage to dislodge dust and lint.
4. Look for a buildup of dirt on the rollers inside the ball cage. This buildup usually appears as a stripe running around the middle of the roller.
5. If dirty, clean the rollers using a cotton swab moistened lightly with isopropyl alcohol.

After cleaning, make sure the rollers are still centered in their channels. Make sure that fluff from the swab is not left on the rollers.

6. Replace the ball and retainer ring.



## Cleaning Drives

You can clean a diskette, CD-ROM, or digital video disc (DVD)-ROM drive using a commercially available cleaning kit. These kits contain pretreated diskettes or a cleaning disc to remove contaminants that accumulate during normal operation.

If the kit does not contain instructions, insert a pretreated diskette or a cleaning disc into the drive and turn on the system. After 20 or 30 seconds, remove the diskette or disc from the drive.



**CAUTION: Do not attempt to clean drive heads with a swab. You may accidentally misalign the heads, rendering the drive inoperable.**

## Power Protection Devices

A number of devices are available that protect against power problems, such as power surges, transients, and power failures.

### Surge Protectors

Surge protectors prevent voltage spikes, which occur during electrical storms or following power interruptions, from entering a system through the electrical outlet. There are various types, and they usually provide a level of protection commensurate with their cost. Some also provide warranty coverage for certain types of damage. Compare joule ratings to determine the relative effectiveness of different devices. Most surge protectors do not protect against lightning strikes, so you should disconnect your computer when lightning is near.

Modems can also be damaged by power surges on telephone lines and should be disconnected during electrical storms. Many surge protectors have a phone jack for modem protection. *Network connections cannot be protected by surge protectors. Therefore, always disconnect the network cable from the network card connector during electrical storms.*

Surge protectors do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

### Line Conditioners

Line conditioners keep a computer's AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors—up to several hundred dollars. However, these devices cannot protect against a complete loss of power.

### Uninterruptible Power Supply

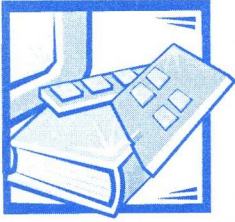
A power loss while your computer is writing to your hard-disk drive can result in loss of data and file corruption. Worst case, your operating system could be corrupted. An uninterruptible power supply (UPS) offers the most complete protection against variations in power because it uses battery power to keep the system running when AC power is lost. AC power, while available, charges the battery; when AC power is

lost, the battery provides power to the system for a limited amount of time—from 15 minutes to an hour or so—depending on the UPS system.



*NOTE: Use a UPS to protect your computer only. Connect other devices, such as a printer, to a separate power strip providing surge protection. The length of time that the battery can supply power following an AC power loss decreases with additional hardware.*

UPS systems can cost a few hundred dollars to several thousand dollars, depending on the operating time they provide when AC power is lost. UPS systems with 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. A UPS system should be Underwriters Laboratories (UL) safety-approved.



## CHAPTER 2

# Installing Upgrades on the System Board

This chapter describes how to install expansion cards and system memory as well as replace the system battery (if necessary). It also tells you how to remove and replace the computer cover and support beam and familiarizes you with internal components.

## Safety First—For You and Your Computer

Working inside your computer is safe—if you observe the following precautions.



### WARNING FOR YOUR PERSONAL SAFETY AND PROTECTION OF YOUR EQUIPMENT

**Before working on your computer, perform the following steps:**

1. Turn off your computer and all devices.
2. Disconnect your computer and devices from their electrical outlets to reduce the potential for personal injury or shock. Also, disconnect any telephone or telecommunication lines from the computer.
3. Wait 5 seconds after turning off the computer before disconnecting devices from the system board to avoid possible damage to the system board.
4. Wear a wrist grounding strap or touch an unpainted metal surface on the computer chassis, such as the power supply bracket, before touching anything inside your computer.

**While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components.**

In addition, Dell recommends that you review the safety instructions at the front of this guide.



## Installation Guidelines

Keep a static-sensitive component in its antistatic packing material until you are ready to install the component in the computer. Just before unwrapping the antistatic packaging, discharge static electricity from your body.

Make sure you have adequate lighting and a clean work space. If you temporarily disconnect cables or remove expansion cards, note the position of the connectors and slots so that you can reassemble the system correctly. Also note the extra connectors available for upgrades.

## Removing and Replacing the Computer Cover and Support Beam



*NOTE: This system uses two types of chassis. One chassis uses a cover with a built-in support beam. In the other chassis, the support beam is attached to the chassis and must be removed to access internal components.*

To remove the computer cover and support beam from a desktop or mini tower system, follow these steps:

1. Observe the "Warning for Your Personal Safety and Protection of Your Equipment" found earlier in this chapter. Also, observe the safety instructions at the front of this guide.
2. If you are working on a mini tower system, lay the computer on its right side with the chassis foot off the edge of the work surface to allow the computer to lay flat.
3. Loosen the cover-mounting thumbscrew shown in Figure 2-1 that secures the cover to the back of the computer.



*NOTE: The thumbscrew is captive and stays in the cover when loosened.*

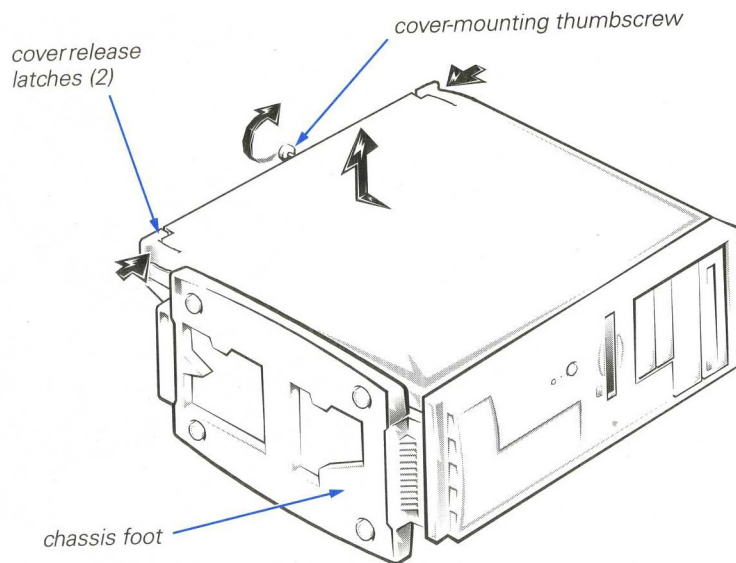


**Figure 2-1. Removing the Computer Cover (Mini Tower Chassis)**



**WARNING:** To prevent cuts, keep your hands clear of the metal edges on the chassis and fan guard as you slide back the cover.

4. Face the front of the chassis. Use your thumbs to press in both cover release latches while pushing the cover backward. Move the cover back about an inch, and then lift it straight up off the chassis.  
  
If necessary, use both hands and work one side at a time.
5. If your chassis has a support beam attached to it (see Figure 2-2), pull up the front end of the beam until it snaps free from its fastener. Lift the front of the beam until the hinged tabs on the back end of the beam clear their slots.

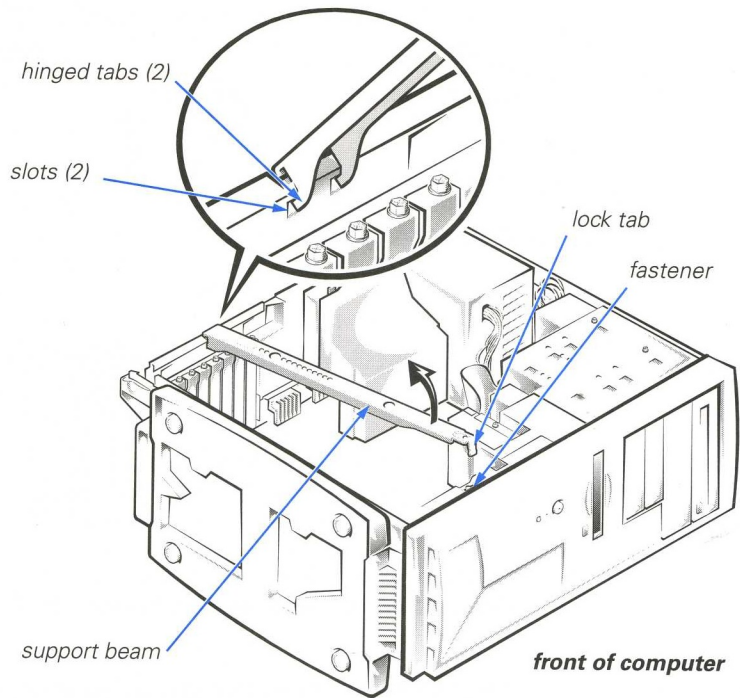


**Figure 2-2. Removing the Support Beam**

Replace the computer cover and support beam on a desktop or mini tower chassis as follows:

1. Check all cable connections, especially those that might have come loose during your work. Fold cables and unused connectors out of the way so that they do not catch on the computer cover or interfere with airflow inside the computer.
2. Check to see that no tools or extra parts (including screws) are left inside the computer.
3. If you removed the support beam from the chassis, slip the beam's hinged tabs into their slots (see Figure 2-2) and lower the beam. Then place the lock tab into its fastener, and press down on the front end of the beam until it snaps into position.
4. Position the cover on the chassis approximately one inch back. Slide the cover forward until it locks into place.
5. Tighten the cover-mounting thumbscrew on the back of the chassis.



## Inside Your Computer

Figures 2-3 and 2-4 show the mini tower and desktop chassis with their covers and support beams removed as an aid in locating internal features and components.

When you look inside your computer, note the *DC power cables* coming from the power supply. These cables supply power to the system board, to internal drives, and to certain expansion cards that connect to external devices.

The flat ribbon cables are the *interface cables* for internal drives. An interface cable connects a drive to an interface connector on the system board or on an expansion card.

The *system board*—the large printed circuit board mounted vertically in the bottom half of the mini tower chassis or secured to the bottom of the desktop chassis—holds the computer's control circuitry and other electronic components. Some hardware options are installed directly onto the system board.

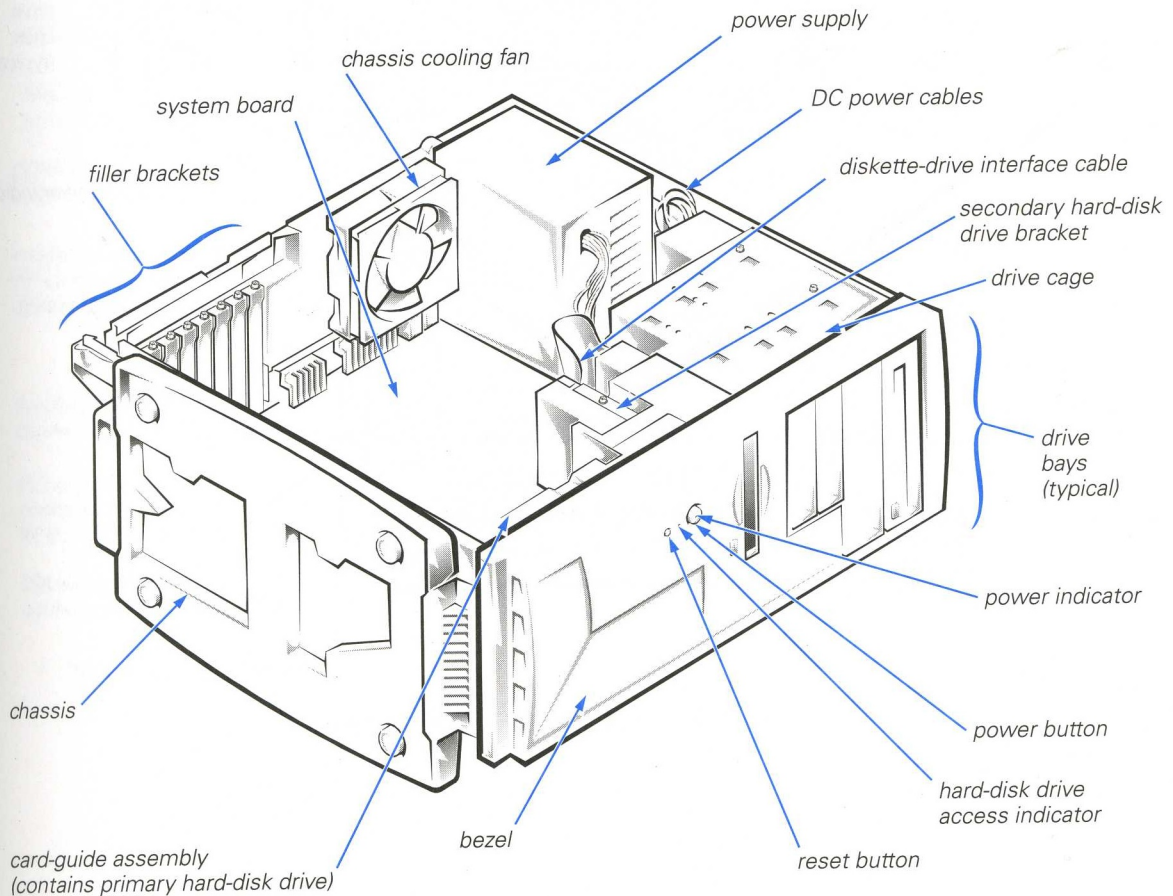


**Figure 2-3. Inside the Mini Tower Chassis**

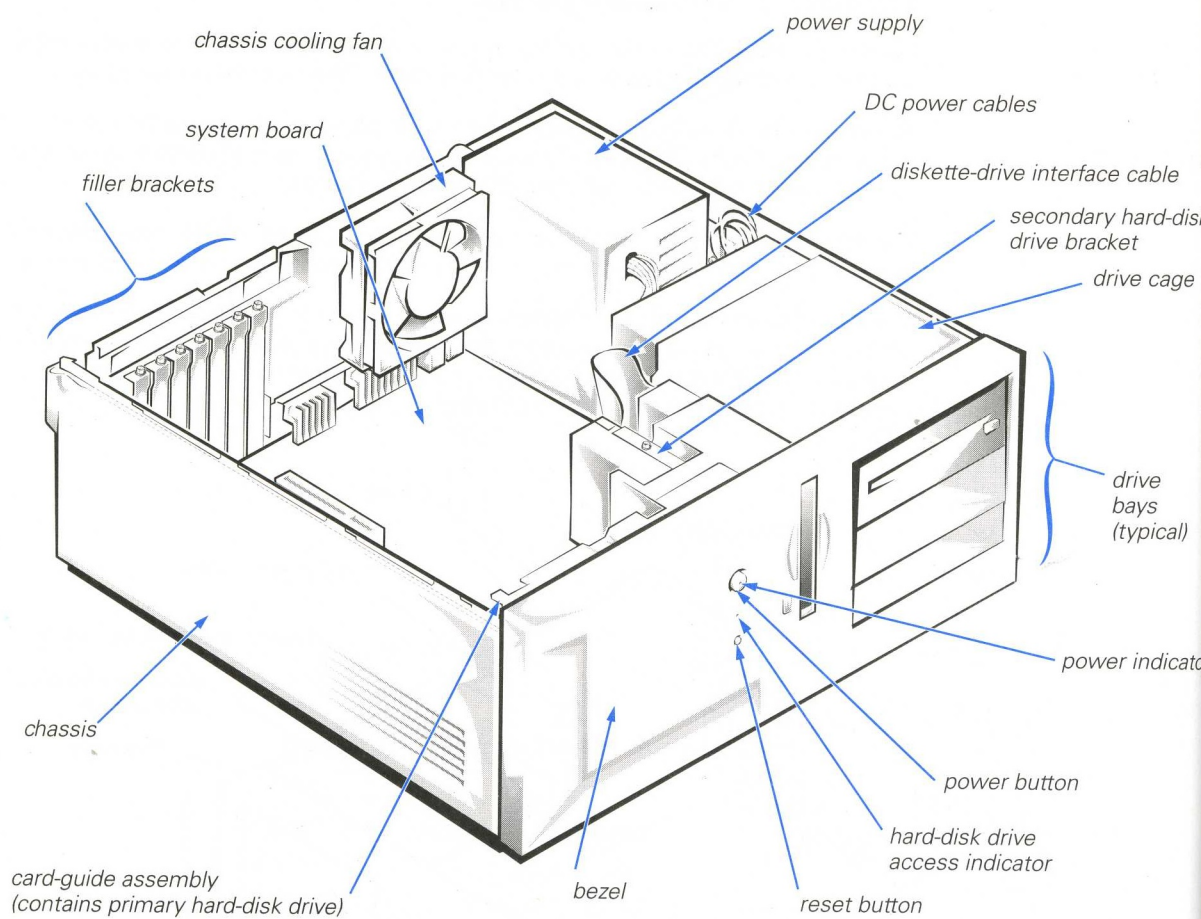
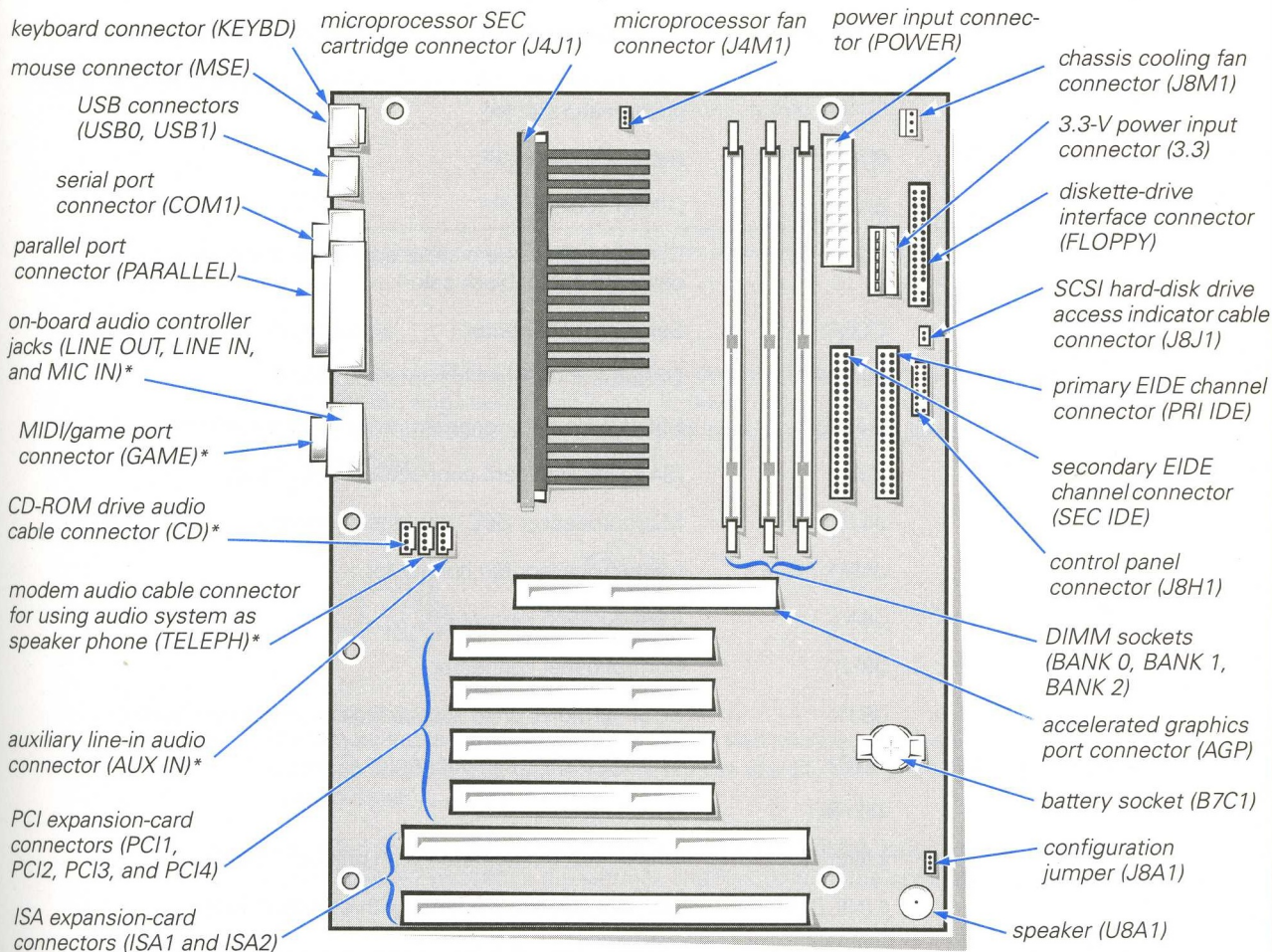


**Figure 2-4. Inside the Desktop Chassis**



# System Board

Figure 2-5 shows the system board connectors and sockets, and Table 2-1 describes their functions.



\* For systems with on-board audio

**Figure 2-5. System Board Features**



**Table 2-1. System Board Connectors and Sockets**

| Connector or Socket | Description                                                                        |
|---------------------|------------------------------------------------------------------------------------|
| 3.3                 | 3.3-V power input connector                                                        |
| AGP                 | Accelerated graphics port connector (brown color)                                  |
| AUX IN              | Auxiliary line-in audio connector (for systems with on-board audio; natural color) |
| B7C1                | Battery socket                                                                     |
| BANK <i>n</i>       | DIMM sockets                                                                       |
| CD                  | CD-ROM drive audio cable connector (for systems with on-board audio; black color)  |
| COM1                | Serial port connector                                                              |
| FLOPPY              | Diskette-drive interface connector                                                 |
| GAME                | MIDI/game port connector (for systems with on-board audio)                         |
| ISA <i>n</i> *      | ISA expansion-card connectors (black color)                                        |
| J4J1                | Microprocessor SEC cartridge connector                                             |
| J4M1                | Microprocessor fan connector                                                       |
| J8A1                | Configuration jumper                                                               |
| J8H1                | Control panel connector                                                            |
| J8J1                | SCSI hard-disk drive access indicator cable connector                              |
| J8M1                | Chassis cooling fan connector                                                      |
| KEYBD               | Keyboard connector                                                                 |
| LINE IN             | Line-in jack (for systems with on-board audio)                                     |
| LINE OUT            | Line-out jack (for systems with on-board audio)                                    |
| MIC IN              | Microphone jack (for systems with on-board audio)                                  |
| MSE                 | Mouse connector                                                                    |
| PARALLEL            | Parallel port connector; sometimes referred to as <i>LPT1</i>                      |
| PCI <i>n</i> *      | PCI expansion-card connectors (natural color)                                      |
| POWER               | Power input connector                                                              |

\* Connectors ISA1 and PCI4 share a single card-slot opening, so only one of the two connectors can be used.

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

**Table 2-1. System Board Connectors and Sockets** (continued)

| Connector or Socket | Description                                                                                   |
|---------------------|-----------------------------------------------------------------------------------------------|
| PRI IDE             | Primary EIDE channel connector                                                                |
| SEC IDE             | Secondary EIDE channel connector                                                              |
| TELEPH              | Modem audio cable connector (for using on-board audio system as a speaker phone; green color) |
| U8A1                | Speaker                                                                                       |
| USB $n$             | USB connectors                                                                                |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## Jumpers

Jumpers are small blocks on the system board with two or more pins emerging from them. Plastic plugs containing a wire fit down over the pins, creating a circuit. To change a jumper setting, pull the plug off its pin(s) and carefully fit it down onto the pin(s) indicated.



The jumper setting is often shown in text as two numbers, such as 1–2. The number 1 is printed on the circuit board so that you can identify each pin number based on the location of pin 1.

Figure 2-5 shows the location of the system-board configuration jumper in your computer. Table 2-2 describes the settings and functions of the configuration jumper.

**Table 2-2. Configuration Jumper Settings**

| Jumper Settings                                                                                           | Description                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Normal mode</p>       | <p>In Normal mode (jumper on pins 1–2), system setup settings and installed password(s) are retained when the system boots. In this mode, an automatic recovery is attempted if the BIOS detects that any of its main blocks are corrupted.</p>                                                                               |
| <p>Maintenance mode</p>  | <p>Starting the system in Maintenance mode (jumper on pins 2–3) automatically starts the system setup program, adds the <b>Maintenance</b> option to the menu bar, and displays the <b>Maintenance</b> screen. The <b>Maintenance</b> screen provides two options: <b>Processor Speed</b> and <b>Clear All Passwords</b>.</p> |

**CAUTION:** Entering Maintenance mode returns all settings in the system setup program to their defaults. Dell strongly recommends that you record or print all current settings before entering Maintenance mode so that you can correct them when the system is reset to Normal mode.

- **Processor Speed** — Options are **350 MHz**, **400 MHz**, and **450 MHz**.

*NOTE:* Before leaving Maintenance mode, reset **Processor Speed** to match your system's processor speed.

**CAUTION:** Never set Processor Speed higher than the speed of the installed microprocessor. Operating the system with a higher setting (for example, running a 350-MHz system with Processor Speed set to 400 MHz) can damage the microprocessor.

- **Clear All Passwords** — Allows you to disable a forgotten password (refer to "Disabling a Forgotten Password" in Appendix B).

- indicates pin 1

*NOTE:* The Glossary in the Online Guide defines abbreviations and acronyms.



## Expansion Card Upgrades

The system board accommodates up to six expansion cards—32-bit Peripheral Component Interconnect (PCI) expansion cards, 8- or 16-bit Industry-Standard Architecture (ISA) expansion cards, and a 32-bit accelerated graphics port (AGP) expansion card. Figure 2-6 shows examples of different types of expansion cards.

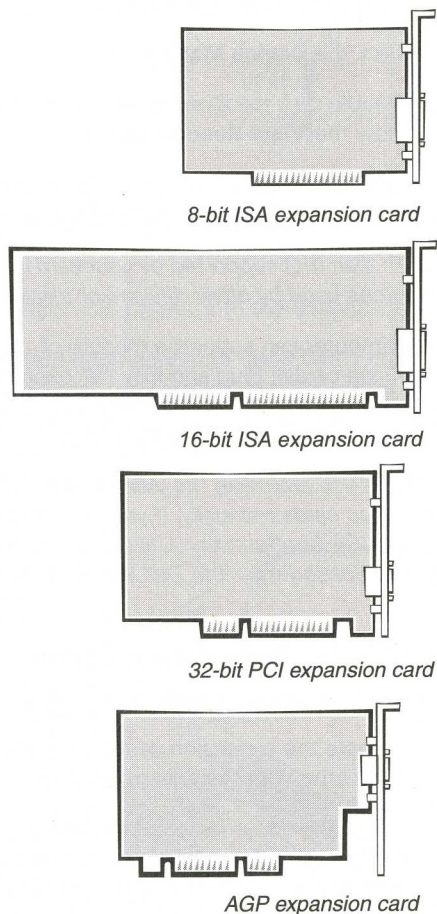


**Figure 2-6. Expansion Cards**

Of the seven expansion-card connectors (see Figure 2-5), the brown one (AGP) is for the AGP video card, the four beige ones (PCI1, PCI2, PCI3, and PCI4) are for PCI cards, and the two black ones (ISA1 and ISA2) are for ISA cards. Because connector ISA1 shares expansion-slot space with connector PCI4, a maximum of six expansion cards can be installed.

Make sure you have a slot available for the type of card you are installing. Also check the Windows 98 Device Manager or Windows NT Diagnostics for an available interrupt request (IRQ) line that is supported by the card.

To check Windows 98 resources, follow these steps:

1. Click the **Start** button, point to **Settings**, and click **Control Panel**.
2. Double-click the **System** icon.
3. Click the **Device Manager** tab.
4. Double-click the **Computer** icon to open the **Computer Properties** window and view the **View Resources** tab.

To check Windows NT resources, start the **Windows NT Diagnostics** in the **Administrative Tools (Common)** folder and view the **Resources** tab.



*NOTE: If an IRQ supported by your card is not available, it may be possible to reassign resources used by other devices or disable unused devices.*

The computer can support a mixture of traditional ISA expansion cards (called *legacy* expansion cards), Plug and Play ISA expansion cards, and PCI expansion cards. The system basic input/output system (BIOS) allows you to install both PCI and ISA Plug and Play expansion cards without performing manual configuration tasks.



*NOTE: If you are using the Windows NT operating system, you should configure ISA expansion cards manually. If you do not have a manually configurable card, you can use the ISA Configuration Utility (ICU) to manage ISA expansion cards. This utility can be downloaded from the Dell World Wide Web site at <http://www.dell.com>.*

## Installing Expansion Cards

To install an expansion card, follow these steps:

1. Prepare the expansion card for installation as instructed in the documentation that came with the expansion card.

Check the documentation to make sure the card is configured to work with other devices already installed in your computer. Set any necessary jumpers or switches on the card to avoid conflicts with devices already installed.

2. Remove the computer cover and support beam according to the instructions in "Removing and Replacing the Computer Cover and Support Beam" found earlier in this chapter.
3. Choose an expansion-card connector for the card.



*NOTE: The ISA1 connector and the PCI4 connector share a single card-slot opening, so only one of these connectors can be used.*

4. Unscrew and remove the metal filler bracket that covers the card-slot opening for the expansion slot you intend to use (see Figure 2-7).

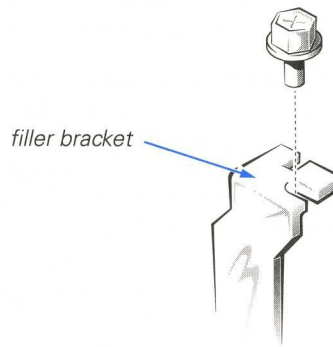


**Figure 2-7. Removing the Filler Bracket**

5. Insert the expansion card firmly into the expansion-card connector.

Cutouts in the card-edge connector align with crossbars in the expansion-card connector. Gently rock the card into the connector until it is fully seated (see Figure 2-8). If the expansion card is full-length, insert the front end of the card into the corresponding card guide at the front of the chassis as you insert the card into its connector.

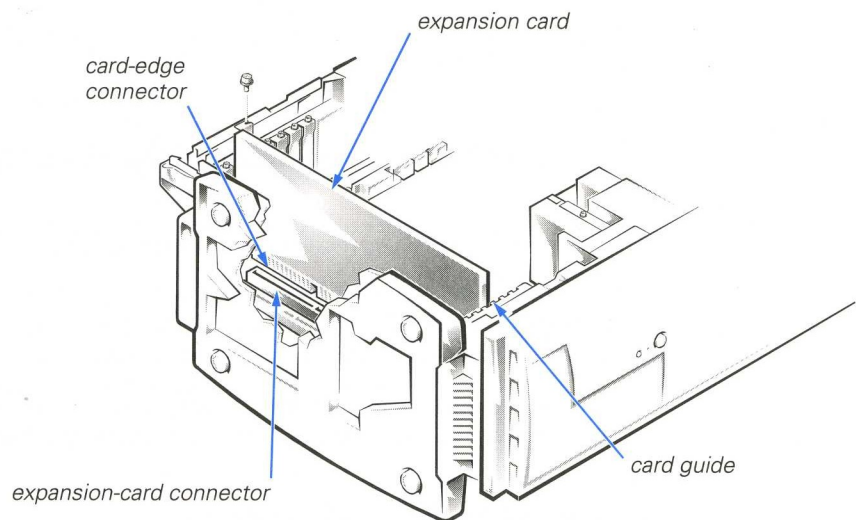


**Figure 2-8. Installing an Expansion Card**



6. When the card is firmly seated in the connector, secure the card-mounting bracket with the screw you removed in step 4.

Make sure the front of the card-edge connector is completely seated in the expansion-card connector. The bottom of the card-mounting bracket must be inside the card-slot opening, and the top of the bracket must be flush against the chassis with the notch aligned with the screw hole in the chassis (see Figure 2-9). "Expansion Cards" in Chapter 6 provides more information on correctly seating an expansion card.

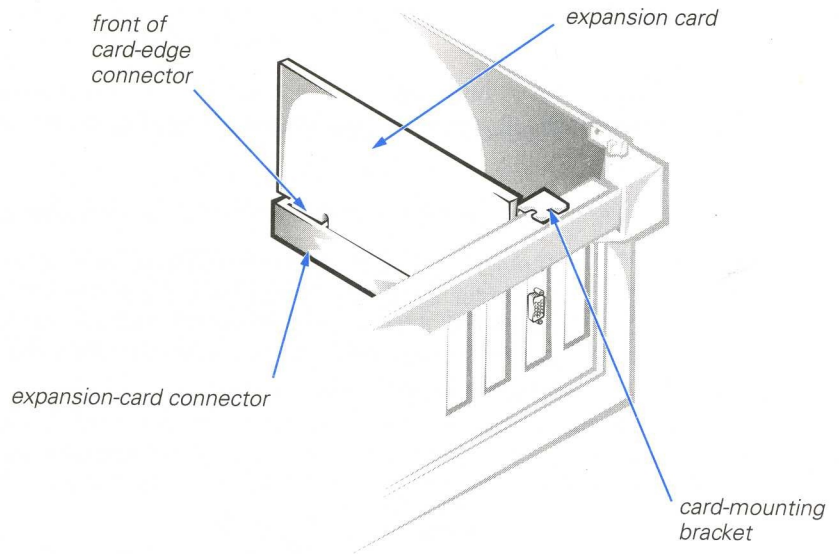


**Figure 2-9. Correctly Installed Expansion Card**

7. Connect any cables required for the card as described in the documentation that came with the card.
8. Replace the computer cover and support beam; reconnect your computer and devices to their electrical outlets and turn them on.

Refer to the documentation that came with the expansion card for information on installing any required drivers for your operating system.

## **Removing Expansion Cards**

To remove an expansion card, follow these steps:

1. Remove the computer cover and support beam according to the instructions in "Removing and Replacing the Computer Cover and Support Beam" found earlier in this chapter.
2. If necessary, disconnect any cables connected to the card.

3. Remove the screw from the card-mounting bracket.
4. Grasp the card by its top corners, and ease it out of its connector.
5. If you are removing the card permanently, install a metal filler bracket over the empty card-slot opening in the chassis.



*NOTE: Installing filler brackets over empty card-slot openings is necessary to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of your computer.*

6. Replace the computer cover and support beam; reconnect your computer and devices to their electrical outlets and turn them on.

## Adding Memory

Memory can be increased to a maximum of 384 megabytes (MB) by installing combinations of 3.3-volt (V) 32-, 64-, and 128-MB dual in-line memory modules (DIMMs) in the three DIMM sockets on the system board. Only 100-megahertz (MHz) DIMMs are supported. Purchasing memory upgrades from Dell Spare Parts ensures system compatibility; these upgrades are also covered under your system warranty.



*NOTE: Your computer is designed for peak performance with specific DIMMs that are validated through rigorous testing. The system may not recognize other synchronous dynamic random-access memory (SDRAM) DIMMs and may fail power-on self-test (POST).*

Dell Dimension XPS Rxxx systems can use SDRAM modules that provide error checking and correction (ECC) capabilities. To support ECC, *all* installed DIMMs must be ECC-capable.

You should install DIMMs starting with BANK 0 and working toward BANK 2, leaving no open socket between installed DIMMs.

Table 2-3 lists the available memory configurations and their socket placements.

**Table 2-3. Available DIMM Configuration Options**

| Total Desired Memory | DIMM Socket |        |        |
|----------------------|-------------|--------|--------|
|                      | Bank 0      | Bank 1 | Bank 2 |
| 64 MB                | 64 MB       | None   | None   |
| 64 MB*               | 32 MB       | 32 MB  | None   |
| 96 MB*               | 64 MB       | 32 MB  | None   |
| 128 MB               | 64 MB       | 64 MB  | None   |
| 128 MB               | 128 MB      | None   | None   |

\* Non-ECC memory configuration only

**Table 2-3. Available DIMM Configuration Options** (continued)

| Total Desired Memory | DIMM Socket |        |        |
|----------------------|-------------|--------|--------|
|                      | Bank 0      | Bank 1 | Bank 2 |
| 192 MB               | 128 MB      | 64 MB  | None   |
| 192 MB               | 64 MB       | 64 MB  | 64 MB  |
| 256 MB               | 128 MB      | 128 MB | None   |
| 256 MB               | 128 MB      | 64 MB  | 64 MB  |
| 384 MB               | 128 MB      | 128 MB | 128 MB |

## Installing a DIMM

To install a DIMM, follow these steps:

1. Remove the computer cover and support beam according to the instructions in "Removing and Replacing the Computer Cover and Support Beam" found earlier in this chapter.



**CAUTION: Do not press near the middle of the DIMM. Doing so could break the module.**

2. Press outward on the plastic securing clips at each end of the DIMM socket to release them as shown in step 1 of Figure 2-10.

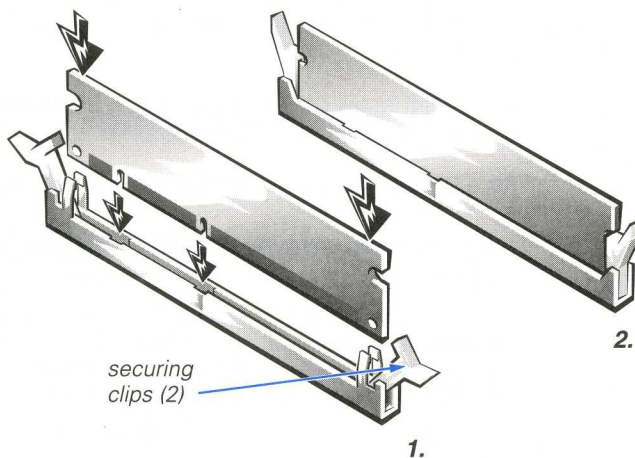


**Figure 2-10. Installing a DIMM**



3. Orient the DIMM so that the cutouts on its edge connector align with the cross-bars in the central groove of the socket.
4. Insert the DIMM straight down into the socket, making sure it fits into the vertical guides at each end of the socket. Press firmly at each end until the DIMM snaps into place.

If you inserted the DIMM correctly, the securing clips snap into the cutouts at each end of the DIMM (see step 2 of Figure 2-10).

5. Replace the computer cover and support beam, and reconnect your computer and devices to their electrical outlets.
6. Reboot the computer system, and press <Del> when prompted to enter the system setup program. Verify that the amount displayed for **System Memory** on the **Main** screen is correct.

If the memory total is incorrect, turn off the system, remove the computer cover and support beam, and reseal the DIMMs in their sockets. Then repeat steps 5 and 6.

7. Insert a backup copy of the *Dell Diagnostics Diskette* into the diskette drive and reboot the system. Run the **RAM** test group in the Dell Diagnostics to test all installed DIMMs.

Refer to Chapter 7, "Running the Dell Diagnostics," for instructions.

## Removing a DIMM

To remove a DIMM, follow these steps:

1. Remove the computer cover and support beam according to the instructions in "Removing and Replacing the Computer Cover and Support Beam" found earlier in this chapter.
2. Press outward on the plastic securing clips at each end of the DIMM socket until the DIMM disengages from the socket.

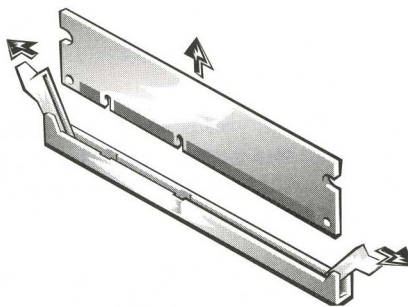


**Figure 2-11. Removing a DIMM**

3. Replace the computer cover and support beam, and reconnect your computer and devices to their electrical outlets.
4. Reboot the computer system, and press <Del> when prompted to enter the system setup program. Verify that the amount displayed for **System Memory** on the **Main** screen is correct.

## Replacing the System Battery

A 3.0-V CR2032 coin-cell battery mounted in a system board socket (see Figure 2-5) maintains system configuration, date, and time information. The battery can last several years.



*NOTE: Leave your power strip turned on when the computer is turned off to extend battery life.*

If the battery expires, the system loses the system configuration information whenever it is disconnected from power. If you have to repeatedly reset this information after turning on the system, replace the battery.

To replace the system battery with another CR2032 coin-cell battery, follow these steps.

### WARNING

**There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.**

1. Make a copy of the screens in the system setup program.

You will need a written or printed copy of the system configuration information to restore the correct settings later. Refer to Appendix B, "System Setup Program," for instructions.

2. Remove the computer cover and support beam according to the instructions in "Removing and Replacing the Computer Cover and Support Beam" found earlier in this chapter.



**CAUTION: If you pry out the battery with a blunt object, insert the object between the battery and the socket. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.**

3. Locate the battery (see Figure 2-5) and pry it out of its socket with your fingers or with a blunt, nonconductive object, such as a plastic screwdriver.

4. Insert the battery into the socket with the side labeled "+" facing up (see Figure 2-12).

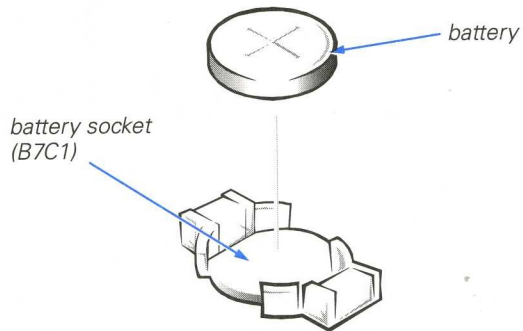


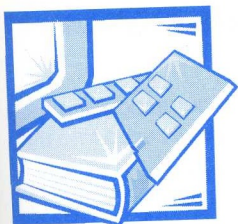
**Figure 2-12. System Battery and Battery Socket**

5. Replace the computer cover and support beam, and reconnect your computer and devices to their electrical outlets.
6. Reboot the computer system, press <Del> when prompted to enter the system setup program, and restore the correct settings.

Refer to Appendix B, "System Setup Program," for instructions.







## CHAPTER 3

# Installing Drives

This chapter provides instructions for removing and replacing the bezel, the drive cage, and front-panel inserts. These procedures may be required for a drive installation. The remainder of the chapter covers the installation of different types of drives.

### Removing and Replacing the Bezel

To remove the bezel, follow these steps:

1. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
2. While facing the front of the computer, press in the tabs at the top and side of the bezel as shown in Figure 3-1.

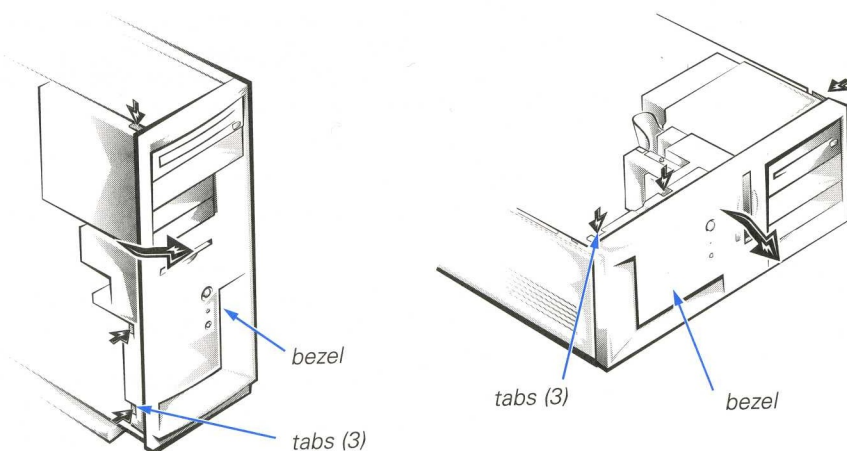


**Figure 3-1. Removing the Bezel**

3. Swing the bezel away from the chassis, disengage the three retaining hooks on the bezel, and carefully pull it away from the chassis.

To replace the bezel, fit the bezel's three retaining hooks into their corresponding slots on the chassis. Rotate the bezel toward the chassis until the hooks snap into the slots.

## Removing and Replacing the Drive Cage

The drive cage (see Figure 3-2) holds the externally accessible drives except for the standard 3.5-inch diskette drive. It holds up to two half-height, 5.25-inch devices and two 3.5-inch devices in the mini tower chassis. In the desktop chassis, it holds up to two half-height, 5.25-inch devices and one 3.5-inch device. The drive cage must be removed to install a drive in one of its bays.

### Removing the Drive Cage

To remove the drive cage, follow these steps:

1. Remove the bezel as described in the previous section.
2. Note the location and orientation of any cables attached to devices in the drive cage; then disconnect the cables.
3. Remove the screw at the side of the drive cage (see Figure 3-2).
4. Slide the drive cage toward you about one inch. Then lift it out of the chassis.



*NOTE: The drive cage has slots on the sides and bottom that engage tabs in the chassis. Three of these tabs contain a detent feature that locks the drive cage into place. The drive cage may be slightly difficult to slide forward until it is detached from the detents.*



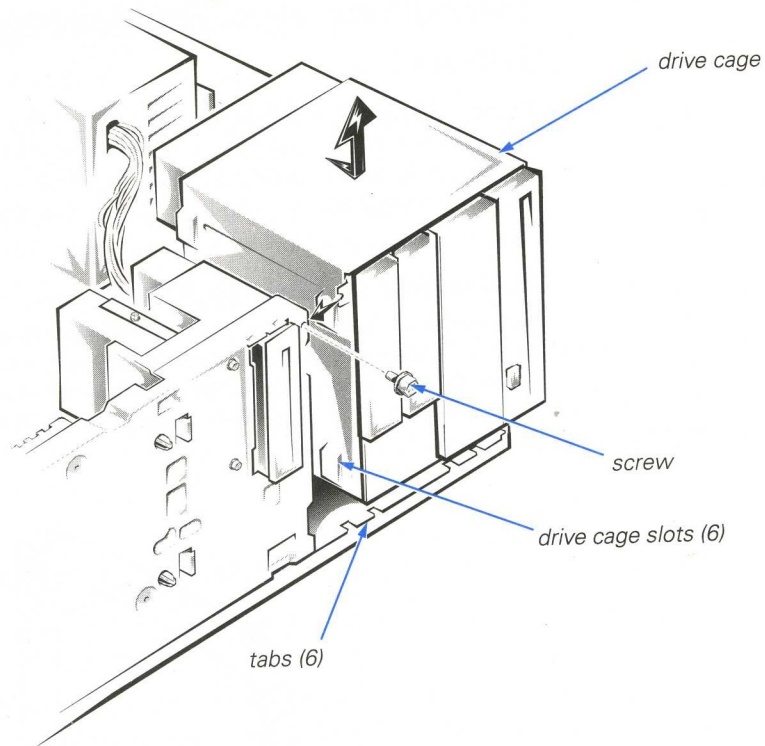


**Figure 3-2. Removing the Drive Cage**

### **Replacing the Drive Cage**

To replace the drive cage after installing a device in it, follow these steps:

1. With the slots on the side of the drive cage extending slightly beyond the front of the chassis, lower the drive cage into the chassis. Slide the drive cage toward the back of the chassis so that the tabs on the chassis fully insert into the slots on the drive cage.

The drive cage and chassis contain matching scribe marks that should line up when the drive cage is correctly installed.

2. Replace the screw that secures the drive cage to the chassis.
3. Reconnect any cables you disconnected earlier.

## Removing and Replacing a Front-Panel Insert

Empty drive bays in the drive cage are covered by a front-panel insert. The insert for a 3.5-inch drive bay is mounted to the inside of the bezel. The insert for the lower 5.25-inch bay is mounted to the drive cage and is removed during installation of a 5.25-inch drive (refer to "5.25-Inch Drives" found later in this chapter).

### Removing a 3.5-Inch Insert

After you have removed the bezel, remove the front-panel insert for the bay you plan to use. From the back of the bezel, as shown for the mini tower chassis in Figure 3-3, press the release tab to the side. Then rotate the insert toward you, and remove it from the bezel. For mini tower computers, you must remove the upper insert to remove the lower insert.

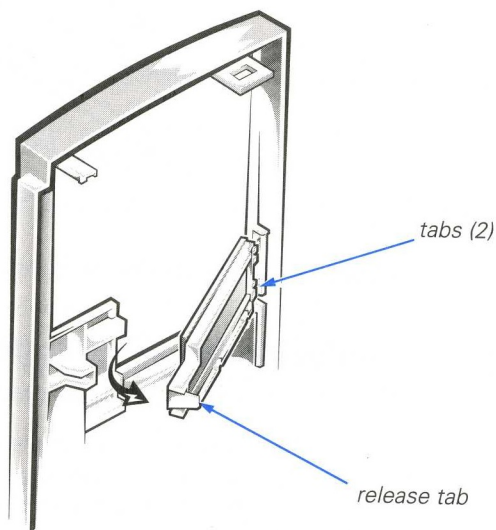


**Figure 3-3. Removing a 3.5-Inch Insert**

### Replacing a 3.5-Inch Insert

If you permanently remove a drive from the drive cage, replace the front-panel insert by inserting its two tabs into the slot in the bezel and rotating the insert forward until it snaps into place.

## Configuring Drives

Before you install your drive, check the documentation that came with the drive to make sure that it is configured to work with other drives already installed in your computer. You may need to change jumper or switch settings on the new drive to avoid conflicts with drives already installed.



*NOTE: If you are installing a tape drive, configure the drive for device address DS4 rather than DS2 or DS3 as may be indicated in the drive documentation.*

All enhanced integrated device electronics (EIDE) devices should be configured for the Cable Select jumper position, which assigns master and slave status to devices by their position on the interface cable. In this configuration, the drive attached to the last connector on the interface cable is the master or boot drive (drive 0) and the drive attached to the middle connector on the interface cable is the slave drive (drive 1). Refer to the drive's documentation for instructions on setting the Cable Select jumper position.

## Connecting Drives

When installing a drive, you connect two cables—a DC power cable and an interface cable—to the back of the drive.

The DC power cable comes from the power supply and contains a 4-pin connector that is keyed to avoid incorrect insertion. Do not force two connectors together if they do not fit properly. Your drive's power input connector (to which you connect the DC power cable) resembles the connector shown in Figure 3-4.

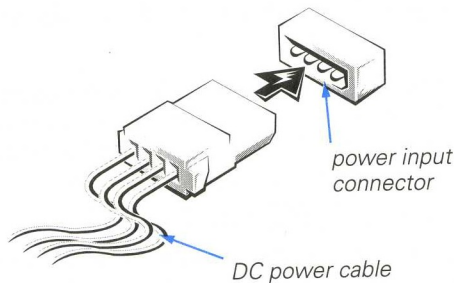


**Figure 3-4. DC Power Cable Connector**

The interface cable is attached to an interface connector either on the system board or on a controller card. The system board contains a diskette-drive interface connector (labeled "FLOPPY") and two EIDE interface connectors (a primary one labeled "PRI IDE" and a secondary one labeled "SEC IDE"). Connect EIDE hard-disk drives to the primary connector; connect EIDE devices such as CD-ROM drives or tape drives to the secondary connector.



The connectors on the interface cables are either header connectors or card-edge connectors, as shown in Figure 3-5. Both types of connectors are usually keyed for correct insertion.

Header connectors have a blocked hole on the cable connector that matches a missing pin on the interface connector.

Card-edge connectors have a notch in the interface connector.

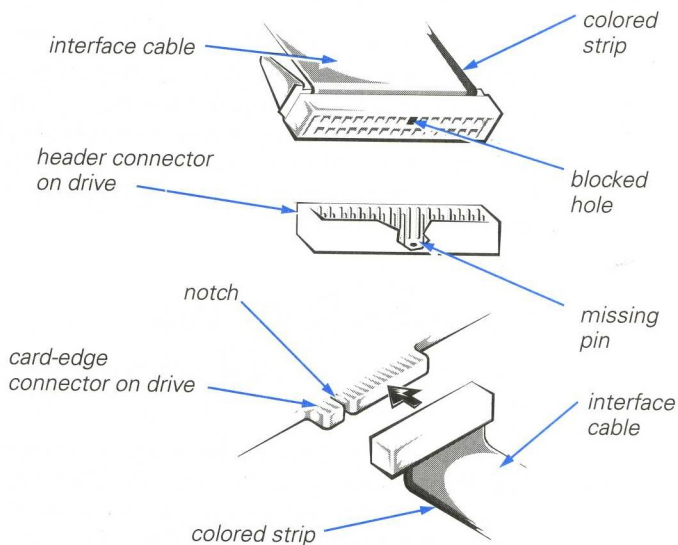


**Figure 3-5. Drive Interface Connectors**

When attaching the interface cable to a drive, be sure to match the colored strip on the cable to pin 1 of the drive's interface connector. For the location of pin 1, look for a silk-screened "1" next to the interface connector or refer to the documentation that came with the drive.



**CAUTION:** When connecting an interface cable, do not place the colored strip on the cable away from pin 1 on the interface connector. Doing so prevents drive operation and could damage the controller, the drive, or both.

## Installing Externally Accessible Drives

The drive cage typically holds diskette drives, tape drives, and CD-ROM drives—up to two half-height, 5.25-inch devices and two 3.5-inch devices in the mini tower chassis. In the desktop chassis, it holds up to two half-height, 5.25-inch devices and one 3.5-inch device.



**NOTE:** Some devices may require additional hardware, such as a mounting kit for installing a 3.5-inch drive in a 5.25-inch bay.

## 5.25-Inch Drives

To install a drive in a 5.25-inch drive bay, follow these steps:

1. Prepare the drive for installation as described earlier in "Configuring Drives."
2. Remove the drive cage as described earlier in "Removing the Drive Cage."
3. If you are installing a drive in the lower 5.25-inch bay, remove the front-panel insert shown in Figure 3-6 by pressing in the two tabs on the right side and rotating the insert toward you until the retaining hook disengages from the drive cage.

If you permanently remove the drive later, reinstall the insert by fitting the hook into the slot on the left side of the drive cage, rotating the insert into place, and snapping the tabs on the right side of the insert into the slots in the drive cage.

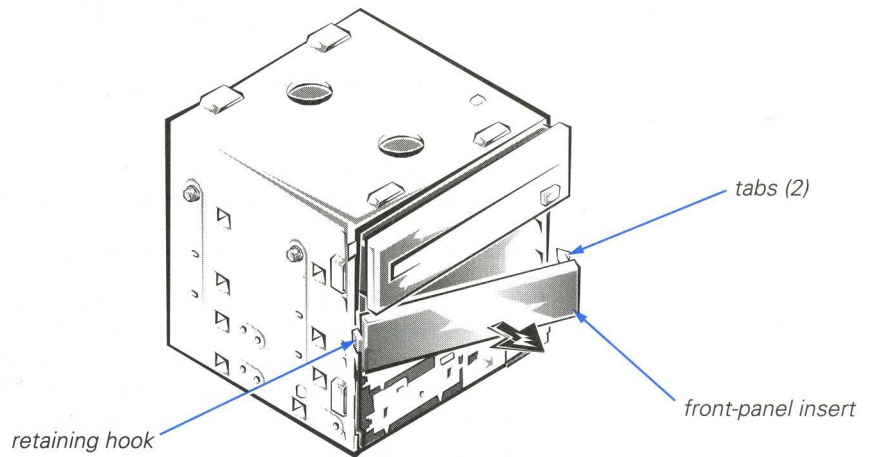


**Figure 3-6. Removing a 5.25-Inch Insert**

4. Slide the drive into its bay, and secure it to the drive cage with two screws on the left and one screw on the right (see Figure 3-7).

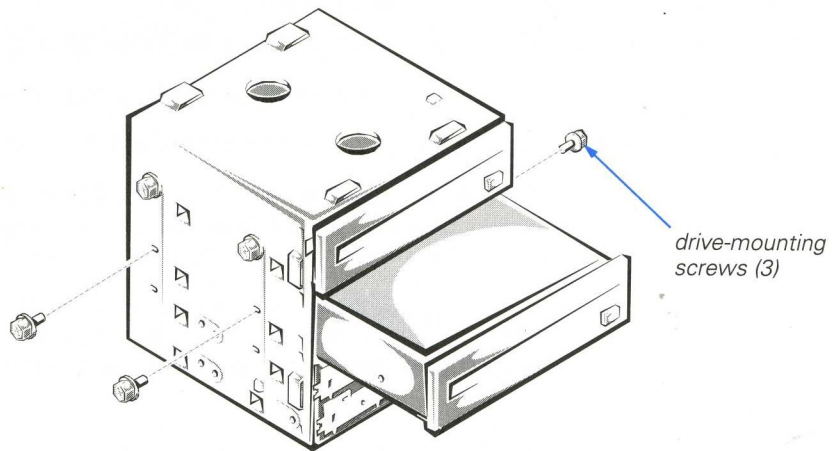


**Figure 3-7. Installing a 5.25-Inch Drive**

5. If you are installing a controller card, configure and install it in an expansion slot now (refer to "Expansion Card Upgrades" in Chapter 2 for instructions).

Install the card as close as possible to the drive cage.



**CAUTION:** Dell does not recommend routing cables over full-height cards because the cables can restrict airflow, cause cooling problems, and interfere with removing and replacing the computer cover and support beam. If you must route cables over full-height cards, be extremely cautious when removing and replacing the computer cover and support beam.

6. Reinstall the drive cage as described earlier in "Replacing the Drive Cage."
7. Connect a DC power cable to the drive as described earlier in "Connecting Drives."
8. Attach the appropriate interface cable to the drive. If you installed a controller card in step 5, attach the other end of the interface cable to the controller card rather than the system board.



**CAUTION:** Match the colored strip on the cable with pin 1 on the interface connector.

9. Replace the bezel as described earlier in "Removing and Replacing the Bezel."
10. Make sure that no cable connections were loosened during the procedure. Arrange cables so that they will not interfere with replacing the computer cover and support beam.
11. Replace the computer cover and support beam and tighten the cover-mounting thumbscrew.



12. If you installed a diskette drive, remove the shipping protector from the drive, and save it in case you later move your computer to a new location.
13. Reconnect your computer and devices to their electrical outlets, and turn them on.
14. If you installed a drive that requires device drivers, such as a CD-ROM drive, refer to the drive's documentation for driver installation instructions.
15. Verify the correct operation of the drive by running the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

## 3.5-Inch Drives

The mini tower computer has two 3.5-inch drive bays, and the desktop computer has one (upper bay).

### Upper 3.5-Inch Bay

To install a drive in the upper 3.5-inch bay, follow these steps:

1. Prepare the drive for installation as described earlier in "Configuring Drives."
2. Remove the drive cage as described earlier in "Removing the Drive Cage."
3. Remove the plastic insert from the bezel as described earlier in "Removing a 3.5-Inch Insert."
4. Remove the 6/32 x 1/4-inch screw securing the drive bracket to the drive cage and remove the bracket. Attach the drive to the bracket with two screws on the right side as shown in Figure 3-9.



*NOTE: The screws used to secure the drive to the bracket and to the left side of the drive cage have 3-millimeter (mm) threads. Be sure to use only these screws when attaching the drive to the bracket and when securing the left side of the drive to the drive cage.*

5. Remove the metal plate covering the bay as shown in Figure 3-8. Work the plate back and forth to break the perforations around the edges.

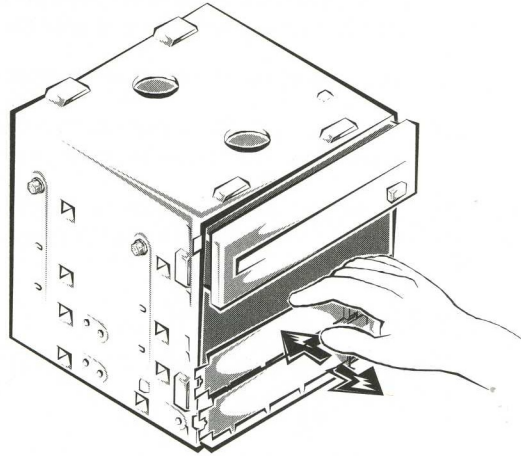


**Figure 3-8. Removing a 3.5-Inch Drive Bay Plate**

6. Slide the drive assembly into the drive bay, and secure it to the drive cage with one screw on each side as shown in Figure 3-9.



*NOTE: Be sure to use the 1/4-inch drive-bracket mounting screw (removed in step 4) on the right side of the drive and the smaller (3-mm) screw on the left side.*

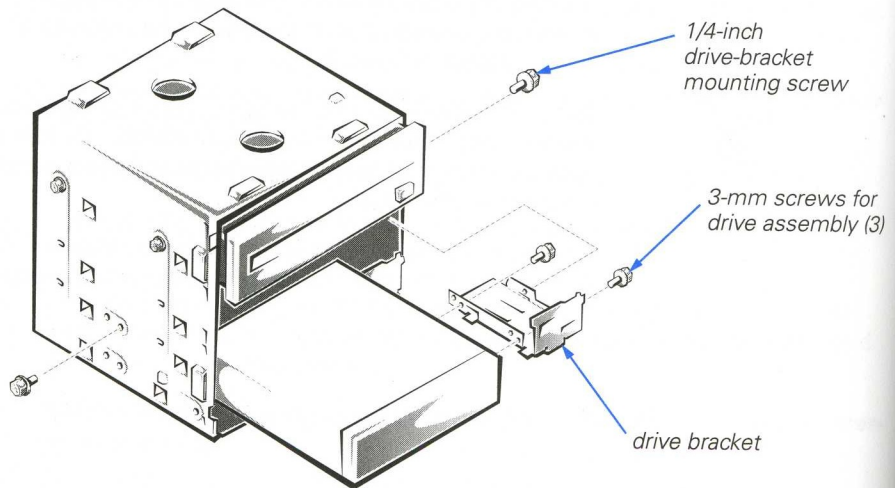


**Figure 3-9. Installing a Drive in the Upper 3.5-Inch Drive Bay**

7. If you are installing a controller card, configure and install it in an expansion slot now (refer to "Expansion Card Upgrades" in Chapter 2 for instructions).

Install the card as close as possible to the drive cage.



**CAUTION:** Dell does not recommend routing cables over full-height cards because the cables can restrict airflow, cause cooling problems, and interfere with removing and replacing the computer cover and support beam. If you must route cables over full-height cards, be extremely cautious when removing and replacing the computer cover and support beam.

8. Reinstall the drive cage as described earlier in "Replacing the Drive Cage."
9. Connect a DC power cable to the drive as described earlier in "Connecting Drives."
10. Attach the appropriate interface cable to the drive. If you installed a controller card in step 7, attach the other end of the interface cable to the controller card rather than the system board.



**CAUTION:** Match the colored strip on the cable with pin 1 on the interface connector.

11. Replace the bezel as described earlier in "Removing and Replacing the Bezel."
12. Make sure that no cable connections were loosened during the procedure. Arrange cables so that they will not interfere with replacing the computer cover and support beam.
13. Replace the computer cover and support beam and tighten the cover-mounting thumbscrew.
14. Reconnect your computer and devices to their electrical outlets, and turn them on.
15. If you installed a drive that requires device drivers, such as a CD-ROM drive, refer to the drive's documentation for driver installation instructions.
16. Verify the correct operation of the drive by running the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

### *Lower 3.5-Inch Bay (Mini Tower Chassis Only)*

To install a drive in the lower 3.5-inch bay of a mini tower computer, follow these steps:

1. Prepare the drive for installation as described earlier in "Configuring Drives."
2. Remove the drive cage as described earlier in "Removing the Drive Cage."
3. Remove the plastic insert from the bezel as described earlier in "Removing a 3.5-Inch Insert."
4. Remove the metal plates covering the 3.5-inch bays. Work the plates back and forth as shown in Figure 3-8 to break the perforations around the edges.
5. Slide the new drive into the drive bay. Secure it to the drive cage, as shown in Figure 3-10, with one screw on the bottom and two screws on the left side.



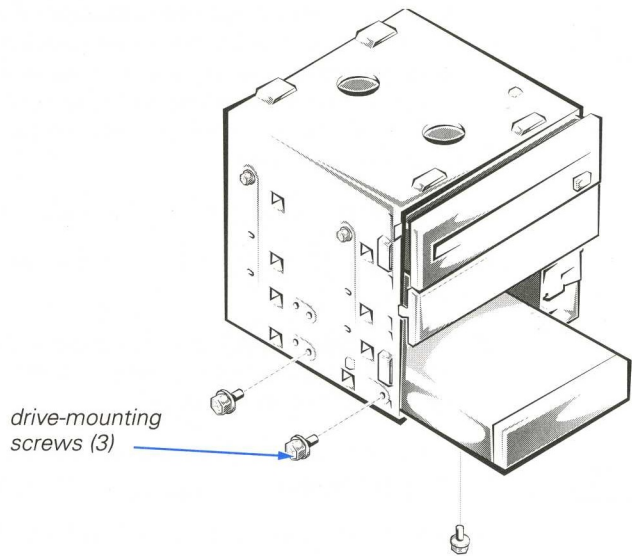


**Figure 3-10. Installing a Drive in the Lower 3.5-Inch Drive Bay (Mini Tower Chassis Only)**

6. If you are installing a controller card, configure and install it in an expansion slot now (refer to "Expansion Card Upgrades" in Chapter 2 for instructions).

Install the card as close as possible to the drive cage.



**CAUTION:** Dell does not recommend routing cables over full-height cards because the cables can restrict airflow, cause cooling problems, and interfere with removing and replacing the computer cover and support beam. If you must route cables over full-height cards, be extremely cautious when removing and replacing the computer cover and support beam.

7. Reinstall the drive cage as described earlier in "Replacing the Drive Cage."
8. Connect a DC power cable to the drive as described earlier in "Connecting Drives."
9. Attach the appropriate interface cable to the drive. If you installed a controller card in step 6, attach the other end of the interface cable to the controller card rather than the system board.



**CAUTION:** Match the colored strip on the cable with pin 1 on the interface connector.

10. Replace the bezel as described earlier in "Removing and Replacing the Bezel."
11. Make sure that no cable connections were loosened during the procedure. Arrange cables so that they will not interfere with replacing the computer cover and support beam.

12. Replace the computer cover and support beam and tighten the cover-mounting thumbscrew.
13. Reconnect your computer and devices to their electrical outlets, and turn them on.
14. If you installed a drive that requires device drivers, such as a CD-ROM drive, refer to the drive's documentation for driver installation instructions.
15. Verify the correct operation of the drive by running the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

## Installing EIDE Hard-Disk Drives

In addition to the externally accessible drive bays, your computer has two internal bays for one-inch-high hard-disk drives. One bay is occupied with your Dell-installed hard-disk drive. Use the procedures in this section to upgrade a hard-disk drive or install a second drive.

### Primary Hard-Disk Drive Bay

To install a drive in the primary hard-disk drive bay, follow these steps:

1. Prepare the drive for installation as described earlier in "Configuring Drives."

*NOTE: For EIDE drives, the boot drive should correspond to **Primary IDE Master** in the system setup program.*

2. Remove the bezel as described earlier in "Removing and Replacing the Bezel."
3. Remove the drive already installed in the bay.

Remove the two screws securing the hard-disk drive to the front of the chassis (see Figure 3-11). Disconnect any cables attached to the drive.

4. Connect a DC power cable and the EIDE cable to the drive as described earlier in "Connecting Drives."

**CAUTION: Match the colored strip on the interface cable with pin 1 on the drive's interface connector.**

5. Install the new drive in the bay.

Orient the drive with its circuit board facing the front of the chassis, and place the drive in the card-guide assembly as shown in Figure 3-11. Secure the drive to the chassis with the two screws you removed in step 3.



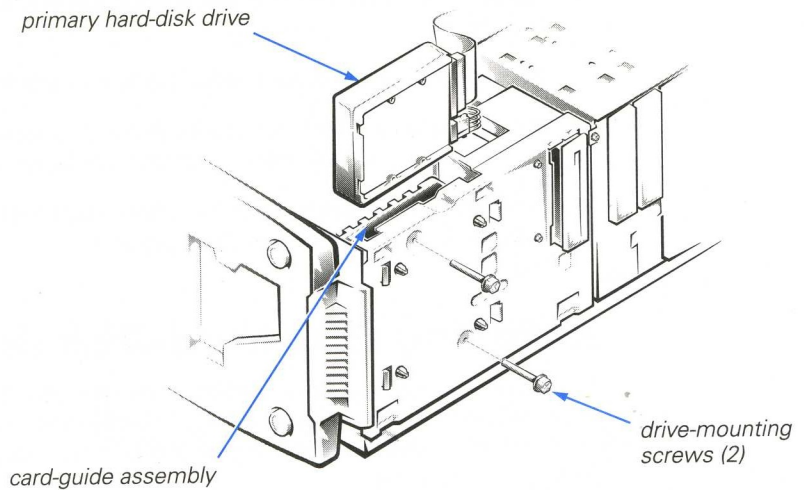


**Figure 3-11. Installing a Drive in the Primary Hard-Disk Drive Bay**

6. If necessary, connect the EIDE cable to the PRI IDE connector on the system board.
7. Replace the bezel as described earlier in "Removing and Replacing the Bezel."
8. Make sure that no cable connections were loosened during the procedure. Arrange cables so that they will not interfere with replacing the computer cover and support beam.
9. Replace the computer cover and support beam and tighten the cover-mounting thumbscrew.
10. Reconnect your computer and devices to their electrical outlets, and turn them on.
11. Verify the correct operation of the drive by running the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

### **Secondary Hard-Disk Drive Bay**

To install a drive in the secondary hard-disk drive bay, follow these steps:

1. Prepare the drive for installation as described earlier in "Configuring Drives."
2. Remove the bezel as described earlier in "Removing and Replacing the Bezel."
3. If a drive is already installed, disconnect any cables attached to the drive.
4. Remove the two screws securing the secondary hard-disk drive bracket to the chassis (see Figure 3-12). Slide the bracket toward the back of the chassis and lift it out.



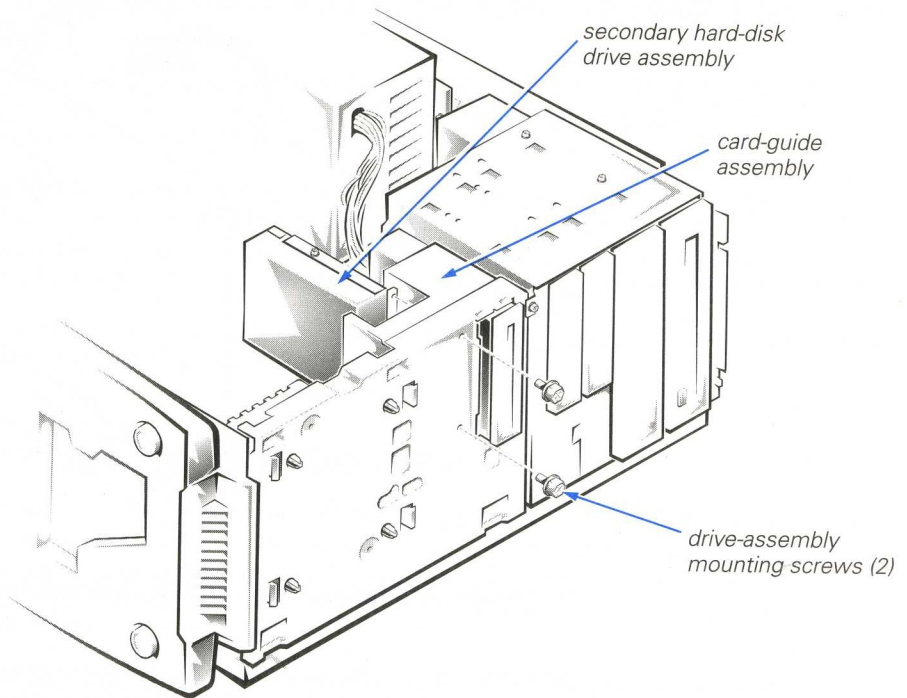


**Figure 3-12. Secondary Hard-Disk Drive Assembly**

5. If a drive is already installed, remove the screw securing the drive to the bracket and rotate the drive out of the bracket.
6. Orient the new drive with its circuit board facing the inside of the bracket. Align the two tabs on the inside of the bracket with two screw holes in the side of the drive, and rotate the drive into the bracket as shown in Figure 3-13. Secure the drive to the bracket with one screw on the side opposite the tabs.

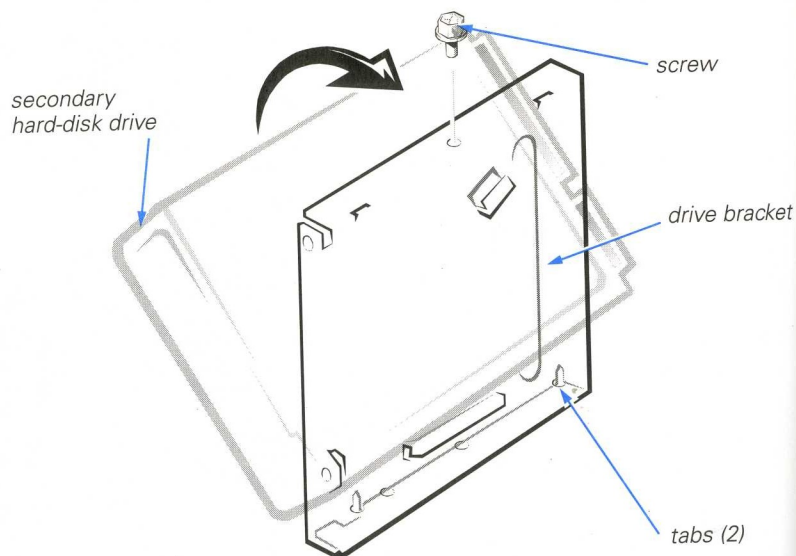


**Figure 3-13. Secondary Hard-Disk Drive Bracket**

7. Align the external tabs on the bracket with the slots in the chassis, and slide the bracket back into place. Secure the bracket to the chassis with the screws you removed in step 4.
8. Connect a DC power cable and the EIDE cable to the drive as described earlier in "Connecting Drives."



**CAUTION: Match the colored strip on the interface cable with pin 1 on the drive's interface connector.**

9. If necessary, connect the EIDE cable to the PRI IDE connector on the system board.
10. Replace the bezel as described earlier in "Removing and Replacing the Bezel."
11. Make sure that no cable connections were loosened during the procedure. Arrange cables so that they will not interfere with replacing the computer cover and support beam.
12. Replace the computer cover and support beam and tighten the cover-mounting thumbscrew.
13. Reconnect your computer and devices to their electrical outlets, and turn them on.
14. Verify the correct operation of the drive by running the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

## Partitioning and Logically Formatting an EIDE Hard-Disk Drive

EIDE hard-disk drives must be physically formatted, partitioned, and logically formatted before they can be used to store data. Every hard-disk drive purchased from Dell is physically formatted before it is sent to you.

For the Windows 98 operating system, all drives use a single partition with the 32-bit file allocation table (FAT32) file system. For the Windows NT operating system, all drives have a 2-gigabyte (GB) primary partition that uses a 16-bit file allocation table (FAT16) file system and a secondary partition formatted in the NT file system (NTFS).

If you ever have to partition and logically format an EIDE hard-disk drive, use the program(s) provided by the operating system.

## Installing SCSI Devices

To use small computer system interface (SCSI) devices in your Dell computer, you must have a SCSI host adapter card, which comes with its own SCSI cable. This cable can be used to attach a variety of SCSI devices (hard-disk drives, tape drives, and so on). The SCSI host adapter configures the devices attached to it as one subsystem—not as independent devices.

Although SCSI devices are installed essentially the same way as other devices, their configuration requirements are different.

### SCSI Configuration Guidelines



**CAUTION:** If the SCSI host adapter has a 68-pin external connector, do not connect cables to all three connectors on the card (internal narrow, internal wide, and external). You can safely connect devices to any two of the three connectors; connecting to all three is a violation of the SCSI standard.

For details on configuring a SCSI subsystem, refer to the documentation that came with the SCSI devices and/or the host adapter card. The following subsections offer some general guidelines.

### SCSI ID Numbers

Each device attached to a SCSI host adapter card, as well as the card itself, must have a unique SCSI ID number from 0 to 7. The SCSI host adapter card is typically configured as SCSI ID 7. The boot hard-disk drive must be configured as SCSI ID 0. Any other SCSI devices attached to the SCSI host adapter card can be configured for any SCSI IDs from 1 to 6. Refer to the documentation for each device for instructions on configuring its SCSI ID.



**NOTE:** There is **no** requirement that SCSI ID numbers be assigned sequentially or that devices be attached to the cable in order by ID number.



## SCSI Cables and SCSI Termination

The SCSI standard requires termination at two end points. If only internal devices are connected, the SCSI host adapter card is terminated at one end. The device end of the cable must then be terminated in one of two ways: either the cable contains a terminator, or the device attached to the end connector must be terminated. However, if you have both internal and external devices attached to the SCSI host adapter card, the card should have termination disabled. External SCSI cables do not have terminators, so termination must be enabled on the external SCSI device itself. Any devices attached to inner connectors on the SCSI cable should have termination disabled. Refer to the documentation for each device for instructions on enabling and disabling termination.

The type of cabling you receive with a SCSI device depends on the type of device you are installing:

- If you are installing an internal narrow SCSI device (such as a CD-ROM drive or tape drive), you have a 50-pin internal SCSI cable as shown in Figure 3-14. One end of this cable attaches to the SCSI host adapter card. The three connectors on the other end of the cable are used for attaching up to three narrow SCSI devices installed in the externally accessible drive bays.

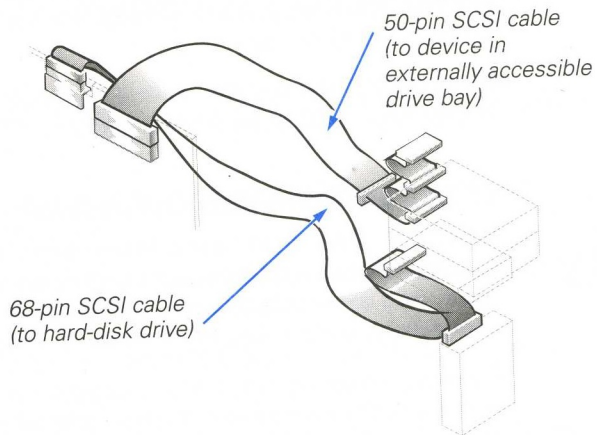


**Figure 3-14. Internal SCSI Cables**

- If you are installing an internal wide SCSI device (such as a wide SCSI hard-disk drive), you have a 68-pin internal SCSI cable as shown in Figure 3-14. One end of this cable attaches to the SCSI host adapter card and the two connectors on the other end of the cable are used for attaching up to two SCSI hard-disk drives.
- If you are installing an external SCSI device, you have a shielded external cable that connects to the external SCSI connector on the SCSI host adapter card. You have a separate power cable to connect the SCSI device to an AC power source.

## General Procedure for Installing SCSI Devices

To configure and install one or more SCSI devices, follow these steps:

1. Determine which connector on the internal SCSI cable you will attach to each SCSI device (refer to "SCSI Configuration Guidelines" found earlier in this section).

2. Unpack each SCSI device and prepare it for installation.

Configure the device for a SCSI ID number and termination, if necessary. For instructions, refer to the documentation that came with the SCSI device as well as "SCSI Configuration Guidelines" found earlier in this section.

3. Install the SCSI devices as appropriate.

*To install a SCSI hard-disk drive, complete steps 2, 3, and 5 of "Primary Hard-Disk Drive Bay" or steps 2 through 7 of "Secondary Hard-Disk Drive Bay" found earlier in this chapter. Then continue with step 4 of this procedure.*

*To install a 5.25-inch SCSI tape drive, CD-ROM drive, or digital audio tape (DAT) drive, complete steps 2 through 4 and step 6 of "Installing a Drive in a 5.25-Inch Drive Bay" found earlier in this chapter. Then continue with step 4 of this procedure.*

*To install a 3.5-inch SCSI tape drive, complete steps 2 through 6 and step 8 of "Upper 3.5-Inch Bay" or steps 2 through 5 and step 7 of "Lower 3.5-Inch Bay (Mini Tower Chassis Only)" found earlier in this chapter. Then continue with step 4 of this procedure.*

*To install an external SCSI tape drive, continue with step 4 of this procedure.*

4. If you are installing a SCSI host adapter card, configure and install it in an expansion slot now. If a SCSI host adapter card is already installed, remove, reconfigure, and reinstall the card at this time.

For instructions on configuring the card, refer to the documentation that came with the card as well as "SCSI Configuration Guidelines" found earlier in this section. For instructions on removing and installing the card, refer to "Expansion Card Upgrades" in Chapter 2.

If you are installing a hard-disk drive, connect the thin access indicator cable to the SCSI host adapter card and to the J8J1 connector on the system board (see Figure 2-5). This cable carries a signal from the SCSI host adapter card to the hard-disk drive access indicator on the computer's front panel whenever a SCSI hard-disk drive is accessed.

5. Attach the SCSI cable to each SCSI device.

*If you are installing an internal SCSI device, firmly press the SCSI cable's header connector onto the 50- or 68-pin connector on the back of the device. The connectors on narrow SCSI cables are keyed for proper positioning—a raised area on*

the outside of the header connector fits into a notch on the device connector. The connectors on wide SCSI cables are shaped so that they can be attached one way only.



**CAUTION: Match the colored strip on the cable with pin 1 on the drive's interface connector.**

*If you are installing an external SCSI device, connect one end of the external SCSI cable to the SCSI bus connector on the back of the device.*

For additional instructions on connecting SCSI devices, refer to "SCSI Cables and SCSI Termination" found earlier in this section.

6. Attach the SCSI cable to the connector on the SCSI host adapter card.

*If you are installing an internal SCSI device, match the colored strip on the internal SCSI cable to the pin-1 end of the 50-pin connector (for a narrow SCSI device) or the 68-pin connector (for a wide SCSI device) on the adapter card. Then press the cable connector firmly onto the adapter card connector.*



**CAUTION: Match the colored strip on the internal SCSI cable with pin 1 on the adapter card connector.**

*If you are installing an external SCSI device, connect the other end of the external SCSI cable to the external connector on the adapter card.*

For additional instructions, refer to the documentation that came with the adapter card.

7. Connect the SCSI device(s) to power.

*If you are installing an internal SCSI device, connect a DC power cable to the power input connector on the SCSI device.*

*If you are installing an external SCSI device, connect the socket end of the power cable to the AC power receptacle on the back of the SCSI device. Insert the other end of the power cable into an electrical outlet.*

Check all other cable connections. Fold all internal cables out of the way to provide airflow for the fan or cooling vents.

8. Replace the front bezel as described earlier in "Removing and Replacing the Bezel."
9. Replace the computer cover and support beam and tighten the cover-mounting thumbscrew.
10. Reconnect your computer and devices to their power sources, and turn them on.
11. If necessary, enter the system setup program and set **Type** to **None** for the appropriate IDE drive options. For instructions, refer to Appendix B, "System Setup Program."

Tape drives attached to a SCSI host adapter card are not part of the system setup program's configuration information.



12. If you installed a SCSI hard-disk drive, partition and format the drive. Then install the operating system and any necessary drivers.

For instructions, refer to the next subsection, "Partitioning and Formatting SCSI Hard-Disk Drives," and the operating system documentation.

13. Test the SCSI device(s).

Test a SCSI hard-disk drive by running the **SCSI Devices** test group of the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

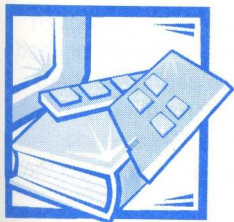
To test a SCSI tape drive, refer to the documentation for the tape drive software to perform a tape drive backup and verification test.

### ***Partitioning and Formatting SCSI Hard-Disk Drives***

You may need to use different programs than those provided with the operating system to partition and format SCSI hard-disk drives. Refer to the documentation that came with your SCSI software drivers for information on installing the appropriate drivers and preparing the SCSI hard-disk drive for use.

For the Windows 98 operating system, all drives use a single partition with the FAT32 file system. For the Windows NT operating system, all drives have a 2-GB primary partition that uses a FAT16 file system and a secondary partition formatted in the NTFS.

If you ever have to partition and logically format a SCSI hard-disk drive, use the program(s) provided by the operating system.



## CHAPTER 4

# Basic Troubleshooting

This chapter guides you through some initial checks and procedures that can solve basic computer problems. It can also direct you to the appropriate chapter in this guide for detailed troubleshooting information and procedures to solve more complex problems. You should complete the checks in this chapter before calling Dell for technical assistance; even if these checks do not provide an immediate solution, they can help support technicians diagnose and fix the problem.

### Backing Up Data Files

You can lose data when a system failure occurs. If your system is behaving erratically, back up your data files immediately (refer to "Preserving Data" in Chapter 1).

You should have created program diskette sets of Dell-installed software during the initial setup of your computer. If you did not do so, follow the instructions in "Making Program Diskette Sets" in Chapter 1 of the *Setup Guide*.



*NOTE: In case of warranty replacement of your hard-disk drive, you receive a blank formatted drive from Dell. It is your responsibility to reinstall application programs and restore data files.*

### Checking the Basics

To perform an initial check of your computer system, follow these steps.



*NOTE: If your computer is wet or damaged, refer to "If Your Computer Gets Wet" or "If Your Computer Is Damaged" in Chapter 6.*

1. If the problem you are experiencing began after making a change to your computer, such as installing new hardware or software, undo the change if possible.

If you need technical assistance, contact the product manufacturer or the company from whom you purchased the product.



*NOTE: DellWare® products are supported by the item's manufacturer. To receive product support information, call 1-800-753-7201.*

If the problem is resolved, check any documentation that came with the option you attempted to install or that describes the change you made. In particular, read any text files (such as **readme.txt**) included with the software package or hardware product; such files contain information updating or supplementing the documentation for the software or hardware. Typically, readme files provide installation information, describe new product enhancements or corrections that have not yet been documented, and list known problems.

If you were trying to install new hardware, double-check configuration settings and available system resources (refer to "Resolving Software and Hardware Incompatibilities" in Chapter 5). Also make sure you changed the appropriate settings in the system setup program for the system's new hardware configuration (refer to Appendix B, "System Setup Program").

2. Perform the steps described in the next section, "Connections."
3. Check the items listed in "Environmental Factors" found later in this chapter.
4. For power problems, refer to "Power" found later in this chapter.
5. Perform the steps in "Boot Routine" found later in this chapter.



*NOTE: The boot routine is the operating system's attempt to load its files into memory from the boot-up sector on the hard-disk drive or bootable diskette.*

6. If you hear a beep code or see a system message, refer to Appendix C, "Beep Codes and System Messages."
7. If appropriate, refer to the subsections found later in this chapter titled "Monitor," "Speakers," "Modem," and "Drives."
8. Verify that the settings in the system setup program match your computer's configuration as explained in Appendix B, "System Setup Program."
9. Use the Dell Diagnostics to check your system (refer to Chapter 7, "Running the Dell Diagnostics").
10. If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

## Connections

Improperly set switches and controls, loose cables, and improperly connected cables are the most likely sources of problems for your computer system. A quick check of all the switches, controls, and cable connections can easily solve these problems.



*NOTE: See the "Features" section of the Online Guide for the location of your computer's external connectors and controls.*



To check computer connections, follow these steps:

1. Turn off the computer, the monitor, and all attached devices.
2. Verify that all power cables are properly connected to the computer, the monitor and devices, and their electrical outlets.
3. Verify that the keyboard and mouse interface cables are firmly attached to the proper connectors on the back of the computer.
4. Verify that any devices attached to the serial port, parallel port, and Universal Serial Bus (USB) connectors are properly connected.

Each of the serial, parallel, and USB interface cable connectors must be firmly attached to an appropriate connector on the back of the computer as well as to the interface connector on the device. The captive screws on the serial and parallel interface cable connectors must be secure enough to ensure a firm connection.

5. Verify that the video-interface cable connector is firmly attached to the video card connector and to the connector on the back of the monitor.

## **Environmental Factors**

A number of external factors, including temperature extremes and humidity, magnetic influences, sources of electromagnetic interference (EMI), and poor input power or signal quality, can interfere with the performance of your computer and attached devices. Monitors are especially susceptible to these environmental factors. The following items can adversely affect the performance of a computer system:

- Inadequate ventilation from operating the computer in a confined space, such as a desk enclosure
- Direct sunlight causing the computer to overheat
- Line noise or power drops and surges from electrical outlets due to poor wiring
- Line noises or surges through telephone lines
- High-voltage electrical appliances on the same circuit or operating in close proximity to the computer
- Speakers, especially subwoofer, or telephone too close to the monitor, generating magnetic fields that distort the display image
- Fluorescent lights causing display flickering or distortion
- Electrical extension cords and keyboard and mouse extension cables
- Too many devices on a power strip or multiple power strips from one electrical outlet
- Electrical conduits in an adjoining wall or elevators on the other side of the wall
- Large metal beams inside the wall behind the system

If removing potential sources of problems does not help, try moving the system.

## Power

If you are experiencing problems with power to your computer, perform these tasks:

- Check the computer's power indicator (see Figures 2-3 and 2-4). When lit, the power indicator verifies that the power supply is operating. Whenever the power is on, the fan on the power supply should also spin. If the fan does not spin, refer to "System Board" in Chapter 6 for further troubleshooting information.
- If your computer is connected to a power strip, turn the power strip off and then on again.
- Plug the computer directly into an electrical outlet, bypassing any power protection devices.
- Turn off the computer and any attached devices, and disconnect them from their electrical outlets. Disconnect any devices attached to the computer except for the mouse and the monitor. Reseat the power cable at the back of the computer; then reconnect the computer and monitor to an electrical outlet, making sure that all connections fit tightly together. Turn on the computer system. If the computer boots, turn it off again and reconnect devices one at a time, turning on the system each time to see if the problem returns.
- Turn off the system, and swap the monitor and computer power cables.
- Plug a device such as a lamp that you know works into the electrical outlet to make sure the power source is OK.

## Boot Routine



*NOTE: Most of the checks in Table 4-1 require observation of computer functions and indications, some of which can occur simultaneously. It may be necessary to reboot the computer several times to complete all these steps.*

**Table 4-1. Boot Routine Indications**

| Indication                | Action                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Error message             | Refer to "System Messages" in Appendix C.                                                                                                                                                                                                                                                                                                                                                                                                         |
| Monitor's power indicator | Most monitors have a power indicator (usually on the front bezel). If the monitor's power indicator does not light up, refer to "Monitor" found later in this chapter.                                                                                                                                                                                                                                                                            |
| Keyboard indicators       | Most keyboards have three indicators in the upper-right corner, which quickly flash on and off during the boot sequence. Press the <Num Lock> key, the <Caps Lock> key, and the <Scroll Lock> key to toggle the keyboard indicators on and off. If the keyboard indicators do not light up, make sure the keyboard connector is firmly seated. Then run the <b>Keyboard</b> test group as described in Chapter 7, "Running the Dell Diagnostics." |

**Table 4-1. Boot Routine Indications** (continued)

| Indication                                                             | Action                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Diskette-drive access indicator                                        | The diskette-drive access indicator should quickly flash on and off when you access data on the diskette drive. You can test the drive by inserting a diskette in the drive, double-clicking <b>My Computer</b> , and then double-clicking the icon for drive A. If the diskette-drive access indicator does not light up, refer to "Drives" found later in this chapter. |
| Hard-disk drive access indicator                                       | The hard-disk drive access indicator should quickly flash on and off when you access data on the hard-disk drive. You can test the drive by double-clicking <b>My Computer</b> and then double-clicking the icon for drive C. If the hard-disk drive access indicator does not light up, refer to "Drives" found later in this chapter.                                   |
| Series of beeps                                                        | Refer to "POST Beep Codes" in Appendix C.                                                                                                                                                                                                                                                                                                                                 |
| Unfamiliar constant scraping or grinding sound when you access a drive | Make sure the sound is not caused by the application program you are running. The sound could be caused by a hardware malfunction. See Chapter 8, "Getting Help," for instructions on obtaining technical assistance from Dell.                                                                                                                                           |
| Absence of a familiar sound                                            | When you turn on your system, you can hear the hard-disk drive spin up, and the system tries to access the boot files from the hard-disk drive or the diskette drive. If the system boots, refer to Chapter 7, "Running the Dell Diagnostics." If your system does not boot, refer to Chapter 8, "Getting Help."                                                          |

## Monitor

This section lists some basic checks you can do for most monitors. Check the documentation that came with the monitor for fault indications and troubleshooting procedures specific to your monitor. If you purchased the monitor from Dell, you can also find troubleshooting information on Dell's World Wide Web site (refer to Chapter 8, "Getting Help").

If you have no picture, try the following checks:

- Make sure the power button is completely depressed (a click is heard when the button is pressed).
- If the power indicator is lit, turn contrast and brightness to their maximum settings.
- Turn off the computer system, and reseal the power cable to the monitor and electrical outlet. Verify that the video-interface cable connector is firmly attached to the video card connector and secured with the captive screws. Then reboot the computer system.
- Verify the power source by plugging in an appliance that you know works.



- Plug the monitor directly into an electrical outlet, bypassing any power protection devices.
- If the power indicator is not lit, check for a bad power cable by turning off the system and swapping the monitor and computer power cables.
- Perform the monitor self-test as described in the documentation that came with the monitor.
- Refer to "Video Cards" in Chapter 6 for further troubleshooting information.

If the picture quality is poor, perform these checks:

- Rotate the monitor to face a different direction. If the picture changes, refer to "Environmental Factors" found earlier in this chapter. Monitors are particularly susceptible to EMI, which causes colors to fade and blend.
- If the orientation of the computer affects the display geometry, check the documentation that came with the monitor for information on adjustments.
- Degauss (demagnetize) the monitor as described in the documentation that came with the monitor.
- If you changed the resolution or refresh rate settings of the monitor, return the monitor to its manufacturer's recommended settings (refer to the monitor documentation).
- Turn off the computer system, and examine the video-interface cable connector for bent, pushed in, broken, or missing pins. Remove any video extension cables, reseal the monitor's video-interface cable connector, and securely tighten the captive screws. Then reboot the computer system.



*NOTE: Some missing pins may be normal for your monitor; check the documentation that came with the monitor.*

- Perform the monitor self-test as described in the documentation that came with the monitor.
- If another monitor or computer is available, try it.
- Move the monitor to another room.
- Reinstall the video drivers as described in the documentation that came with the video card.
- Refer to "Video Cards" in Chapter 6 for further troubleshooting information.

## Speakers

Perform the following checks for speaker problems:

- Ensure the speakers are properly connected as shown on the *Getting Started* sheet or as described in the documentation that came with the speakers.
- Verify that the speakers and/or subwoofer are turned on if they have a power control.
- Turn up the volume knob on the speakers.

- If the audio is distorted, make sure that the volume is not turned to its maximum setting. Turn off the monitor to check for interference.
- Reseat all speaker connections and make sure they are inserted fully. Verify that the audio jacks are not bent or broken.
- Turn up the volume by clicking the yellow speaker icon in the Windows 98 or Windows NT taskbar and adjusting the volume setting.
- Plug the speakers into the headphone jack of the CD-ROM or digital video disc (DVD)-ROM drive, make sure the headphone volume control is turned up, and play a music CD.
- If your system includes an on-board audio controller, check for conflicts as described in "Resolving Software and Hardware Incompatibilities" in Chapter 5. Then reinstall the audio drivers (refer to "Audio Drivers" in Chapter 5).
- If your system has a sound card, refer to "Sound Cards" in Chapter 6 for further troubleshooting information.

## Modem



**CAUTION: Connect the modem to an analog line only. Using a nonanalog line, such as a digital or private branch exchange (PBX) line, will damage the modem.**



*NOTE: If your modem can dial and connect to one Internet service provider (ISP) or to a fax machine, your modem is functioning properly. For assistance, contact the ISP to which you cannot connect.*

If you are experiencing problems with a modem, perform the following checks.

- If you have any other telephone devices plugged into this line, such as answering machines, dedicated fax machines, or line splitters, then bypass them and plug the modem cable directly into the telephone connector on the wall.
- Reseat the cable connections.
- Try a different cable; if you are using a cable that is 10 feet or more in length, try a shorter one.
- Check that the modem cable is connected to the jack labeled "TELCO" or "LINE" on the modem.
- Plug a telephone cable into the jack labeled "PHONE" on the modem and listen for a dial tone.
- Disconnect the cable from the modem and plug it directly into a telephone. Listen for a dial tone.
- Low connection speeds can be caused by line noise. If you have persistent problems, contact your telephone company to check for data noise and imbalanced lines.
- Refer to "Modem" in Chapter 6 for further troubleshooting information.

## Drives

If you have diskette drive problems, perform the following checks:

- Make sure the diskette is not write-protected if you are trying to copy data to it.
- Try a different diskette in the drive. If the new diskette works, the original one may be defective.
- Check drive operations at the MS-DOS® prompt in the Dell Diagnostics (refer to "Starting the Dell Diagnostics" in Chapter 7) and the Windows operating system.
- Check the settings on the **Diskette Options** submenu of the system setup program as described in Appendix B, "System Setup Program."
- Run the **Diskette Drives** test group as described in Chapter 7, "Running the Dell Diagnostics."
- Refer to "Diskette Drive" in Chapter 6 for further troubleshooting information.

If you have CD-ROM or DVD-ROM drive problems, perform the following checks.



*NOTE: Inconsistencies in the manufacturing of CD-ROM media may cause some higher-speed CD-ROM drives to vibrate more than others. Such vibration and associated noise does not indicate a defect in the drive or the CD.*

- Double-click **My Computer** and check to see if the drive is recognized by the system. Most of the common boot sector viruses cause the CD-ROM or DVD-ROM drive to "disappear." Use virus-scanning software (if Dell installed Windows 98 on your system, you should already have virus-scanning software) to check for and remove any viruses.
- Clean the disc with a soft, lint-free cloth and isopropyl alcohol.
- Clean the drive as described in "Cleaning Drives" in Chapter 1.
- Try another CD or DVD title.



*NOTE: Because of different conventions currently used in the industry, not all DVD titles work in all DVD-ROM drives.*

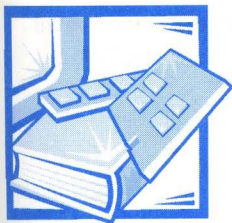
- Enter the system setup program as described in Appendix B, "System Setup Program," and verify that **Type** is set to **Auto** for the appropriate IDE drive option.
- Run the **IDE (ATA/ATAPI) Devices** test group as described in Chapter 7, "Running the Dell Diagnostics."
- Refer to "CD-ROM and DVD-ROM Drives" in Chapter 6 for further troubleshooting information.

If you have hard-disk drive problems, perform the following checks:

- For Windows 98, run the **ScanDisk** utility by clicking the **Start** button, pointing to **Programs—>Accessories—>System Tools**, and clicking **ScanDisk**.
- For Windows NT, run the error-checking utility by opening the property sheet of the affected volume(s) and clicking **Check Now** in the **Error-checking** section of the **Tools** tab.



- Run the **IDE (ATA/ATAPI) Devices** test group as described in Chapter 7, "Running the Dell Diagnostics."
- Check the settings on the **IDE Configuration** submenu of the system setup program as described in Appendix B, "System Setup Program."
- Refer to "Hard-Disk Drive" in Chapter 6 for further troubleshooting information.



## CHAPTER 5

# Software Solutions

This chapter describes software procedures, such as reinstalling drivers, that can often solve problems with your computer system.

### Using Windows 98 Power Management Features

When you run Windows 98, the power management features of your Dell system can be set through the **Power Management Properties** window. If you press <Del> when the computer boots, your computer's power management features can be set through the system setup program.

To set the power management features through Windows 98, follow these steps:

1. Click the **Start** button, point to **Settings**, and click **Control Panel**.
2. Double-click the **Power Management** icon.
3. Set the power management features in the **Power Management Properties** window.

The **Power Schemes** tab allows you to select the power scheme (**Always On**, **Home/Office Desktop**, and **Portable/Laptop**) and power mode settings for your computer. The following power mode settings are available:

- **System standby** — Turns off the monitor, stops the hard-disk drive, and turns off other internal devices so that the computer uses less power. When the system resumes from standby mode, the Windows desktop is restored exactly as it appeared prior to entering standby mode.
- **Turn off monitor** — Turns off the monitor so that the system uses less power. You can press any key to turn on the monitor. The Windows desktop is restored exactly as it appeared before the monitor was turned off.
- **Turn off hard disk** — Turns off the hard-disk drive so that the system uses less power. You can press any key to turn on the hard-disk drive. The Windows desktop is restored exactly as it appeared before the hard-disk drive was turned off.

*NOTE: It may take Windows 98 several seconds to resume the system from the power scheme settings.*



The **Advanced** tab allows you to display the **Power Meter** on the Windows 98 taskbar and to display a password prompt when the system resumes from standby mode.

## Reinstalling Drivers

Often device problems can be corrected by reinstalling the appropriate drivers. Also, hardware manufacturers frequently provide updated drivers that support feature enhancements or that correct problems. Obtain updated drivers for products purchased from Dell from the Dell World Wide Web site (<http://www.dell.com>). The following subsections provide instructions on specific drivers.



**CAUTION:** Drivers available on the Dell Web site have been validated for correct operation on Dell systems. Installing drivers obtained from other sources may cause errors or performance degradation.

### Video Drivers

Your system's video drivers were installed at Dell and are operative when you receive the system. If you ever need to reinstall these drivers, refer to the documentation that came with the video card for instructions.

### Audio Drivers

Your system's audio drivers were installed at Dell and are operative when you receive the system—no further installation or configuration is needed. If you ever need to reinstall these drivers for systems with on-board audio, refer to the appropriate procedure in the following subsections.



**NOTE:** If your system includes a sound card, refer to the documentation that came with the sound card for instructions on reinstalling audio drivers.

### Audio Drivers for Windows 98

To reinstall the audio drivers for the Windows 98 operating system, follow these steps:

1. Start the Windows 98 operating system.
2. If you have not already done so, make a diskette set of the Crystal SoundFusion drivers using the Program Diskette Maker (located in the **Dell Accessories** folder).
3. Insert *Crystal SoundFusion Driver Disk 1* into drive A.
4. Click the **Start** button, and then click **Run**.
5. Type `a:\setup.exe` and press <Enter>.
6. When the **Crystal Driver Install/Uninstall** window appears, click **Install Driver**.



7. When prompted to restart your system to complete the installation, remove the diskette from drive A and click **Restart**.

When Windows 98 restarts, the PCI multimedia audio device is detected and the **Update Device Driver Wizard** window appears.

8. Insert *Crystal SoundFusion Driver Disk 1* into drive A again. Then click **Next**.
9. Click **Finish**.
10. In the **Insert Disk** window, click **OK**.
11. In the **Copying Files** window, type a : \ in the **Copy files from:** box and click **OK**.

The audio driver files are copied to your system. Then the CS4236B device is found and the **Update Device Driver Wizard** window reappears.

12. Click **Next**.
13. Click **Finish**.
14. When prompted, insert *Crystal SoundFusion Driver Disk 2* into drive A and click **OK**.
15. When prompted, insert *Crystal SoundFusion Driver Disk 3* into drive A and click **OK**.
16. In the **New Hardware Found** window, type a : \ in the **Copy files from:** box and click **OK**.

The remaining audio driver files are copied to your system, and the installation is complete.

### Audio Drivers for Windows NT 4.0

To reinstall the audio drivers for the Microsoft Windows NT 4.0 operating system, follow these steps:

1. Start the Windows NT operating system.
2. If you have not already done so, make a diskette set of the Crystal SoundFusion drivers using the Program Diskette Maker (located in the **Dell Accessories** folder).
3. Insert *Crystal SoundFusion Driver Disk 1* into drive A.
4. Click the **Start** button, point to **Settings**, and click **Control Panel**.
5. Double-click the **Multimedia** icon.
6. In the **Multimedia Properties** window, click the **Devices** tab and then click **Add**.
7. In the **Add** dialog box, select **Unlisted or Updated Driver** and click **OK**.
8. In the **Install Driver** dialog box, type a : \ and click **OK**.

9. In the **Add Unlisted or Updated Driver** dialog box, select **CrystalWare Audio Driver NT** and click **OK**.
10. When prompted, insert *Crystal SoundFusion Driver Disk 2* into drive A to complete the installation.

After the drivers have been installed, there will be a new **Audio Control** folder with two programs—**Audio Mixer** and **Audio Input**.

## Reinstalling the McAfee VirusScan Program

Dell installed the McAfee VirusScan program on your system's hard-disk drive and provided a copy of McAfee VirusScan on CD. If you need to reinstall McAfee VirusScan, follow these steps:

1. Turn on your system.
2. Insert the VirusScan CD into your CD-ROM or digital video disc (DVD)-ROM drive.
3. Double-click the **My Computer** icon, and then double-click the **CD-ROM drive** icon.
4. Double-click the **Vscan95** folder.
5. In the **Vscan95** window, double-click the **setup.exe** icon.
6. In the **Welcome to Setup** window, click **Next>**.
7. Read the software license agreement, and click **Yes** if you accept the agreement.
8. In the **Setup Type** window, click one of the following setup types:
  - **Typical** — Performs a complete installation of VirusScan.
  - **Compact** — Installs VirusScan with the minimum required options.
  - **Custom** — Installs VirusScan with user-definable options (you are prompted to select the components you want to install).
9. Select a destination directory for VirusScan. Click **Browse** to find the directory you want or click **Next>** to accept the default.
10. In the **Confirming Installation Settings** window, review the new settings and click **Next>**.

Your system copies the appropriate files, and VirusScan performs a scan of your system.

When the scan is finished, the **Scan Complete** window appears.

11. Click **OK**.

The **McAfee Emergency Disk Creation Utility** dialog box appears. (You will use the emergency diskette if VirusScan finds a virus on your computer.)

12. To make an emergency diskette, insert a blank diskette into your diskette drive and click **Continue**.

If you do not want to make an emergency diskette at this time, click **Cancel**. (You may create this diskette at another time.)

13. In the **What's New in VirusScan** dialog box, click **Yes** to read the **whatsnew.txt** file or click **No** to continue.

The **Changes Made** window appears and tells you what files were changed on your system by **VirusScan Setup**.

14. Click **Next>**.

15. In the **Restart System to Take Advantage of New Components** window, click **Finish** to restart your system.

## Resolving Software and Hardware Incompatibilities

Windows 98 interrupt request (IRQ) conflicts occur if a device either is not detected during the Windows 98 Plug and Play setup or is detected but incorrectly configured. To check for conflicts, follow these steps:

1. Click the **Start** button, point to **Settings**, and click **Control Panel**.
2. Double-click **System** in the **Control Panel**.
3. Click the **Device Manager** tab.
4. Check for conflicts with the other devices in the **Device Manager** list.

Conflicts are indicated by a yellow exclamation point (!) beside the conflicting device or a red X if the device has been disabled.

5. Click any conflicting device listed to bring up the **Properties** window so you can determine what needs to be reconfigured or removed from the **Device Manager**. Resolve these conflicts before checking specific devices.
6. Click the malfunctioning device type in the **Device Manager** list.
7. Double-click the icon for the specific device in the expanded list.

The **Properties** dialog box appears.

8. If there is an IRQ conflict, the **Device status** area in the **Properties** dialog box reports what expansion cards or devices are sharing the device's IRQ. Resolve the IRQ conflicts.

You can also use the Windows 98 Hardware Conflict Troubleshooter. Click **Help** from the **Start** menu, double-click **Troubleshooting** on the **Contents** tab, and then double-click **If you have a hardware conflict**.



If you suspect a resource conflict using Windows NT, open the **Event Viewer** in the **Administrative Tools (Common)** folder and check for any relevant event log messages. Start the **Windows NT Diagnostics** from the **Administrative Tools (Common)** folder and check current resource assignments on the **Resources** tab. Then click the **Services** tab and view the state of **Services and Devices**.

## Reinstalling Windows 98

If Dell installed a Microsoft Windows operating system on your computer, under normal circumstances you should never need to reinstall the operating system.



**CAUTION: Dell recommends against reinstalling the Windows operating system over your currently installed Windows operating system. Doing so could render your operating system inoperative.**

If advised by a Dell technical support representative to reinstall Windows 98, perform the following steps *in the order listed*.



**CAUTION: If you have not already done so, it is extremely important that you create program diskettes of your Dell-installed utilities and drivers. If you reinstall Windows 98 without the Dell-installed utilities and drivers, your system may be unusable.**



**NOTE:** The instructions in this section apply only to reinstalling a Dell-installed Windows 98 operating system.

1. Turn on the system.
  2. Insert the *Microsoft Boot Disk Windows 98 Series* diskette into the diskette drive and the *Microsoft Windows 98* CD into the CD-ROM or DVD-ROM drive.
  3. Reboot the computer.
  4. When the **Microsoft Windows 98 Startup Menu** appears, ensure that the **1. Start Windows 98 setup CD-ROM** option is highlighted and press <Enter>.
  5. When the **Microsoft Windows 98 Setup** window appears, press <Enter>.
  6. If you see a message prompting you to reinstall Windows 98 over your current operating system, use the down-arrow key to highlight **Continue setup and replace your current operating system**. Then press <Enter>.
  7. If you see a message stating that Windows 98 is about to prepare the system for installing the operating system, press <Enter>.
- ScanDisk** checks your system files.
8. When a message appears to alert you that ScanDisk has finished checking the system drive(s), type *x* if prompted.

9. When the **Windows 98 Setup** window appears, click **Continue**.

Windows 98 checks your hard-disk drive and prepares your system for installing the operating system.

10. When prompted for the directory to install the Windows 98 files, ensure that **c:\windows** is selected and click **Next>**.

11. When prompted to quit all programs before continuing the setup, click **OK**.

The **Windows 98 Setup** wizard appears and checks your system for available hard-disk drive space.

12. When prompted to save the existing system files, click **Yes (Recommended)**.

13. When prompted for the drive in which you want to save the system files, click **OK** to select the default directory or type the path of another directory.

Windows 98 saves the system files to the designated directory.

14. When the **Establish Your Location** window appears, select your regional location and click **Next>**.

This setting tells Windows 98 how to display Internet content.

15. When prompted to create the start-up diskette, remove the boot diskette from the diskette drive and click **Next>**.

16. Label a blank diskette as instructed, insert the diskette into the diskette drive, and click **OK**.

If a dialog box instructs you to format the diskette, click **Format**.

17. After you have created the start-up diskette, remove the diskette from drive A and click **OK**.

18. When the **Start copying files** window appears, click **Next>**.

The **Welcome to Microsoft Windows 98** window appears and displays information about the operating system while the files are copied to your hard-disk drive.

*NOTE: This step may take several minutes to complete. The approximate time is displayed on the Windows 98 status bar.*

When the files have been copied to the hard-disk drive, Windows 98 prompts you to restart the system.

19. Click **OK** to restart the system.

The system may reboot a second time.



20. When the **Start Wizard** appears, click **Finish**.

A series of windows appears to inform you that Windows 98 is setting up hardware, initializing drivers, and detecting hardware and Plug and Play devices.

Windows 98 restarts the system and detects additional hardware settings.

The **Windows 98 Setup** window appears and lists which items Windows 98 is setting up.

21. If the **Enter Windows Password** window appears, enter your user name and, if applicable, your password. Then click **OK**.

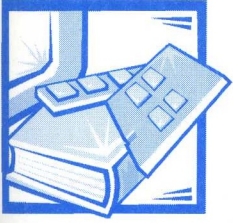
The **Username** field must be completed; the **Password** field is optional.

Windows 98 updates the system settings and restarts the system.

The **Welcome to Windows 98** screen appears.

22. Reinstall any necessary drivers.





## CHAPTER 6

# Checking Inside Your Computer

This chapter describes troubleshooting procedures for expansion cards, memory, drives, and the system board. Some procedures require you to access the inside of the computer and remove and reinstall components. Procedures are also included for reseating the microprocessor and checking a wet or damaged computer.

### Expansion Cards

If an error message indicates an expansion-card problem or if an expansion card seems to perform incorrectly or not at all, the problem could be a faulty connection, a conflict with software or other hardware, or a faulty expansion card. If software problems and conflicts have been eliminated, follow these general steps to troubleshoot expansion cards:

1. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
2. Remove all cables attached to the expansion cards.
3. Remove each expansion card, and verify any jumper or switch settings.
4. Reinstall the expansion cards, fully seating the cards in their connectors.

Figure 6-1 illustrates a correctly seated expansion card, and Figure 6-2 illustrates incorrect expansion-card installations.

5. Reconnect the cable connectors to the appropriate connectors on the expansion cards.
6. Replace the computer cover and support beam, connect all external cables, and turn on the system.

The following subsections provide troubleshooting procedures for some specific types of expansion cards.

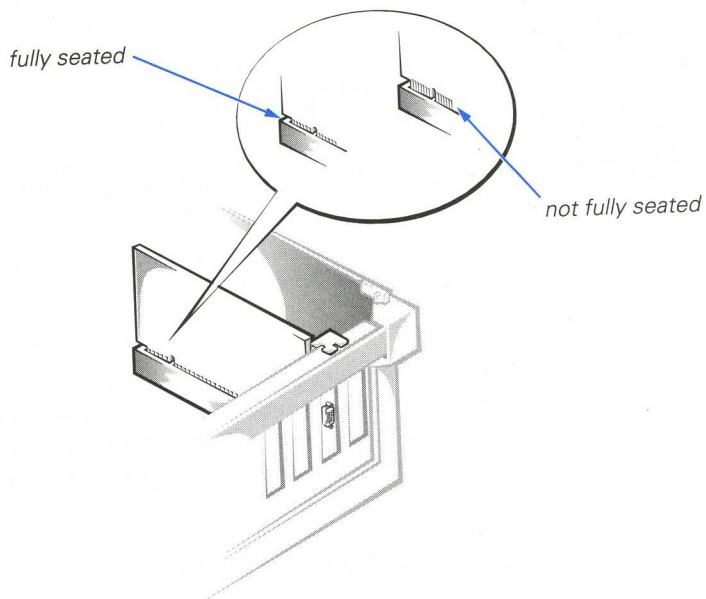


**Figure 6-1. Expansion-Card Installation**

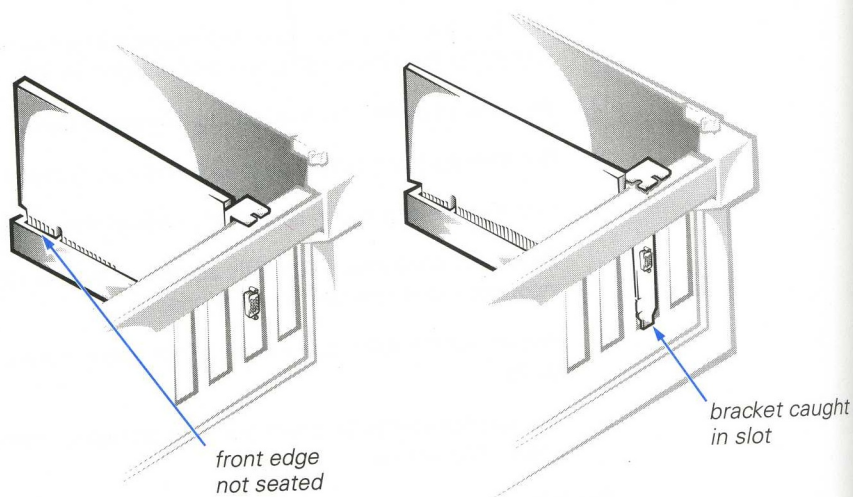


**Figure 6-2. Incorrect Expansion-Card Installations**

## Modem

In general, modem malfunctions may be caused by any of the following problems:

- Incorrectly installed modem
- Interrupt request (IRQ) conflicts
- Incorrect information (.inf) files
- Multiple drivers installed
- Incorrect Plug and Play configuration

To troubleshoot a modem card, follow these steps:

1. Check for modem IRQ conflicts.  
  
Refer to "Resolving Software and Hardware Incompatibilities" in Chapter 5. Resolve any modem IRQ conflicts and restart the computer system.
2. Verify the modem configuration.
  - a. Click the **Start** button, point to **Settings**, and click **Control Panel**.
  - b. Double-click **Modems** in the **Control Panel**. Remove any invalid or unused entries from the list. If you are using Windows NT, check the modem properties and then proceed to step 3.
  - c. Click the **Diagnostics** tab.
  - d. Highlight the COM port that the modem is using.
  - e. Click **More Info** to verify that the system can communicate with the modem. If the modem reports information to the system, the modem is operating properly.
3. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
4. Remove and reinstall the modem, fully seating the card in its connector (see Figure 6-1).
5. Replace the computer cover and support beam, connect all external cables, and turn on the system. Enter the system setup program as described in Appendix B, "System Setup Program," and verify that **Serial port A** on the **Peripheral Configuration** submenu is set to **Auto**.



## Sound Cards

If you completed the basic speaker checks (refer to "Speakers" in Chapter 4) and suspect a problem with a sound card, perform the following checks:

- Check for conflicts as described in "Resolving Software and Hardware Incompatibilities" in Chapter 5.
- Reinstall the audio drivers that came with the sound card.
- Perform the expansion-card checks described in "Expansion Cards" at the beginning of this chapter.

## Video Cards

If you completed the basic monitor checks (refer to "Monitor" in Chapter 4) and suspect a problem with the video card, perform the following checks:

- Click the **Start** button, point to **Settings**, and click **Control Panel**. Double-click the **Display** icon, and click the **Settings** tab. Try different **Color Palette** and **Screen area** (Windows 98) or **Desktop Area** (Windows NT) settings.
- Change the display type to standard video graphics array (VGA) as follows:  
Reboot the system. For Windows 98, press <F8> when you see the **Starting Windows 98** message, and then select **Safe Mode** from the boot manager screen. For Windows NT, select **Windows NT Workstation 4.0 [VGA Mode]** from the boot manager screen.
- Reinstall the video drivers as described in the documentation that came with the video card.
- Perform the expansion-card checks described in "Expansion Cards" at the beginning of this chapter.

## Network Cards

In general, network malfunctions may be caused by the following problems:

- Wrong or incorrectly installed network interface controller (NIC) drivers
- IRQ conflicts
- Damaged RJ45 connector or patch cable
- Bad hub port connection
- Incorrectly installed or malfunctioning network card

*NOTE: If you can connect to the network but are having problems accessing network resources, contact your network administrator.*



To troubleshoot a network card, follow these steps:

1. Run the **Network Interface** test group in the Dell Diagnostics if you have a supported network card (refer to Chapter 7, "Running the Dell Diagnostics").

2. Run the diagnostics for your network card as described in the documentation that came with the card.

If the network card is not detected, go to step 3.

If the network card does not pass all the tests, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

3. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
4. Remove all expansion cards installed in the computer (refer to "Removing Expansion Cards" in Chapter 2) except the video card to prevent a card that is incorrectly configured from causing an interrupt or input/output (I/O) port resource conflict.
5. Replace the computer cover and support beam, connect all external cables, and turn on the system.
6. Clear nonvolatile random-access memory (NVRAM) as described in "Clearing NVRAM" in Appendix B.
7. Check the network connections if the network hardware is functional.
  - a. Check the network card connector for physical damage.
  - b. Ensure that the cable is inserted properly.
  - c. Replace the patch cable or network cable from the wall jack to the computer.
  - d. If replacing the patch cable or network cable does not solve the problem, try moving the computer to another location on the network.
  - e. If there is still a problem connecting to the network, ensure that the right drivers are being used.
8. If the network card is still not detected, refer to Chapter 8, "Getting Help," for information on obtaining technical assistance. If the network card is detected, repeat step 2.

## System Memory

A computer memory problem can be caused by a faulty dual in-line memory module (DIMM) or a faulty system board. If you received an error message after making changes in the system setup program, restore the original values and reboot the system. If a random-access memory (RAM) error message appears, troubleshoot the memory by following these steps:

1. Turn on the computer and monitor.
2. If you hear a beep code, refer to "POST Beep Codes" in Appendix C.

3. Enter the system setup program as described in Appendix B, "System Setup Program," and verify **System Memory** on the **Main** screen.

If the memory amount displayed does not match the computer's configuration, reseal the DIMMs as described in the next subsection.

## Reseating DIMMs

1. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
2. Remove the DIMMs as described in "Removing a DIMM" in Chapter 2.
3. Verify that the proper memory is installed.

Refer to "Adding Memory" in Chapter 2 for information on supported memory.

4. Check the DIMMs and DIMM sockets for broken tabs and damaged connectors.

If a module is damaged, replace it. If a DIMM socket is damaged, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

5. Reinstall the DIMMs as described in "Installing a DIMM" in Chapter 2.
6. Replace the computer cover and support beam; reconnect the system to an electrical outlet and turn it on.

7. Enter the system setup program, and verify **System Memory** on the **Main** screen again.

If the problem still exists and you have a single DIMM, repeat the preceding steps, installing the DIMM in a different socket. If you have more than one DIMM, try installing one at a time. Install a known good DIMM if available.

8. If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

## Drives

If an error message indicates a drive problem or if a drive seems to perform incorrectly or not at all, the problem could be a faulty connection, a basic input/output system (BIOS) problem, a conflict with other hardware, or a faulty drive. If BIOS problems and conflicts have been eliminated, follow these general steps to troubleshoot drives:

1. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
2. Remove the interface cable and the DC power connector from the malfunctioning drive, and inspect them for damage.



3. Reconnect the interface and DC power connectors to the appropriate connectors on the drive, making sure they are firmly seated.
4. Replace the computer cover and support beam, connect all external cables, and turn on the system.

The following subsections provide troubleshooting checks for some specific types of drives.

### **Diskette Drive**

If you completed the basic drive checks (refer to “Drives” in Chapter 4 and this chapter) and suspect a problem with the diskette drive, disconnect other devices, such as a tape drive, on the same interface cable.

### **CD-ROM and DVD-ROM Drives**

If you completed the basic drive checks (refer to “Drives” in Chapter 4 and this chapter) and suspect a problem with a CD-ROM or digital video disc (DVD)-ROM drive, perform the following checks:

- Check for hardware conflicts as described in “Resolving Software and Hardware Incompatibilities” in Chapter 5.
- If you have Windows 98, double-click the **System** icon in the **Control Panel** and check the **Performance** tab for any abnormal indications.
- Clear NVRAM as described in “Clearing NVRAM” in Appendix B.

### **Hard-Disk Drive**

If you completed the basic drive checks (refer to “Drives” in Chapter 4 and this chapter) and suspect a problem with a hard-disk drive, perform the following checks:

- Clear NVRAM as described in “Clearing NVRAM” in Appendix B.
- Disconnect other devices on the same interface cable.

### **System Board**

A system board problem can result from a defective system board component, a faulty power supply, or a defective component connected to the system board. If an error message indicates a system board problem, the boot routine does not complete (refer to “Boot Routine” in Chapter 4), or if the power supply fan does not spin when power is on, follow these steps:

1. Verify that the electrical outlet to which the computer is connected is properly functioning. Test the electrical outlet with another electrical device, such as a lamp.
2. Remove the computer cover and support beam as described in “Removing and Replacing the Computer Cover and Support Beam” in Chapter 2.

3. Remove all expansion cards as described in "Removing Expansion Cards" in Chapter 2.
4. If the system does not boot, check connections and remove potential shorts or overloads.
  - a. Reseat the control panel cable and power cable connectors from the power supply to the system board (see Figure 2-5 for connector locations).
  - b. Remove the primary hard-disk drive as described in steps 2 and 3 of "Primary Hard-Disk Drive Bay" in Chapter 3. Disconnect the DC power cable connectors to all other drives *except* for the 3.5-inch diskette drive.
  - c. Disconnect all devices attached to the computer except the keyboard and monitor.
5. Reinstall the video card only, fully seating the card in its connector (see Figure 6-1).
6. Replace the computer cover and support beam; reconnect the system to an electrical outlet and turn it on.

If the power indicator flashes or the system does not boot, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.



*NOTE: System start-up time is extended if you removed the primary hard-disk drive in step 4. Ignore any error messages received during the boot routine in this situation.*

7. Enter the system setup program (refer to Appendix B, "System Setup Program"), and update the system configuration information as necessary for the expansion cards removed in step 3.
8. Insert the *Dell Diagnostics Diskette* into drive A, and reboot the system. Run the **System Set** test group in the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

If the tests complete successfully, proceed to the next step. Otherwise, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

9. Remove the *Dell Diagnostics Diskette* from drive A, turn off the system, and disconnect it from the electrical outlet. Remove the computer cover and support beam.
10. If you removed the primary hard-disk drive in step 4, reinstall it as described in steps 4 through 8 of "Primary Hard-Disk Drive Bay" in Chapter 3. Then repeat steps 6 through 9 of this procedure.

11. One at a time, reconnect the DC power connectors to other drives (if you performed step 4) and reinstall each of the expansion cards you removed in step 3. Repeat steps 6 through 9 after each installation.
12. If the problem returns after you reconnect a drive not obtained from Dell, remove it and contact the manufacturer. Otherwise, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

If the problem returns when an expansion card is reinstalled, go to step 13.

13. Try the expansion card in a different slot.

If reseating the cards does not correct the problem, and if the problem is caused by a card not obtained from Dell, contact the manufacturer. Otherwise, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

## **Reseating the Microprocessor**

If you are instructed by a Dell technical support representative to reseat the single-edge contact (SEC) cartridge and heat sink, follow these steps.



**WARNING: The SEC cartridge and heat sink can get extremely hot during system operation. Be sure that the assembly has had sufficient time to cool before you touch it.**



**WARNING: When handling the SEC cartridge and heat sink assembly, take care to avoid sharp edges on the heat sink.**

1. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
2. Remove the DIMMs as described in "Removing a DIMM" in Chapter 2.
3. Pinch the ends of the retainer bar, and then slide the bar toward the front of the computer to remove it (see Figure 6-3).



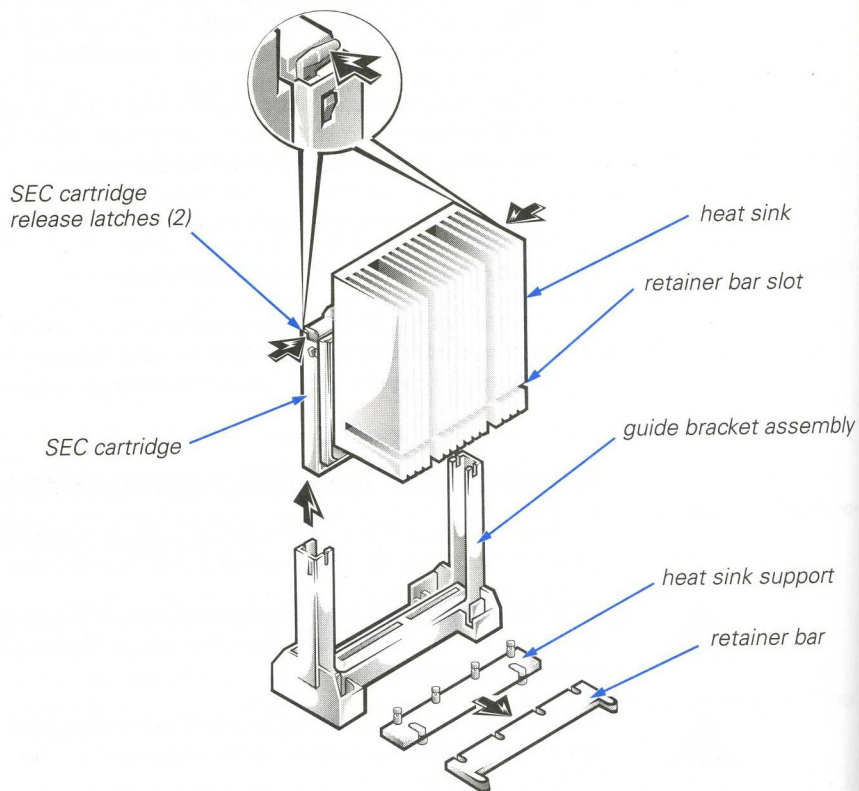


**Figure 6-3. Removing the SEC Cartridge and Heat Sink**

4. Press the SEC cartridge release latches until they snap into position.  
On some assemblies you may need to hold the latches until the cartridge is removed.
5. Grasp the SEC cartridge firmly, and pull straight up on the cartridge to remove it from the guide bracket assembly.  
You must use up to 15 pounds of force to disengage the SEC cartridge from the connector. Do not rock the cartridge while removing it.
6. Pull out the cartridge release latches until they snap into place.
7. Slide the SEC cartridge into the guide bracket assembly, with the heat sink toward the front of the computer, and firmly seat the assembly.  
You must use up to 25 pounds of force to seat the SEC cartridge. Do not rock the cartridge while inserting it into the connector.
8. Slide the retainer bar back into the retainer bar slot and press firmly until it snaps into place on the heat sink support.

9. Replace the DIMMs as described in "Installing a DIMM" in Chapter 2.
10. Replace the computer cover and support beam, and reconnect the system to an electrical outlet.
11. Insert the *Dell Diagnostics Diskette* into drive A, reboot the system, and run the **System Set** test group in the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

If the tests do not complete successfully, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

## ***If Your Computer Gets Wet***

Liquids from spills, splashes, and excessive humidity can damage your computer. If an external device (such as a printer) gets wet, contact the manufacturer for instructions. If your computer gets wet, follow these steps:

1. Immediately unplug the computer from the electrical outlet.
2. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
3. Let the computer dry for at least 24 hours.

Make sure that it is thoroughly dry before proceeding.

4. Remove all expansion cards installed in the computer (refer to "Removing Expansion Cards" in Chapter 2) except the video card.
5. Replace the computer cover and support beam; reconnect the system to an electrical outlet and turn it on.

If the system does not have power, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

6. Turn off the system, and disconnect it from the electrical outlet. Remove the computer cover and support beam, and reinstall all the expansion cards you removed in step 4.

Refer to "Installing Expansion Cards" in Chapter 2 for instructions.

7. Replace the computer cover and support beam, and reconnect the system to an electrical outlet.
8. Insert the *Dell Diagnostics Diskette* into drive A, reboot the system, and run the **System Set** test group in the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

If the tests do not complete successfully, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.

## If Your Computer Is Damaged

If your computer is dropped or damaged, check it to make sure it still functions properly. If a device attached to the computer is dropped or damaged, contact the manufacturer for technical assistance. To troubleshoot a damaged computer, follow these steps:

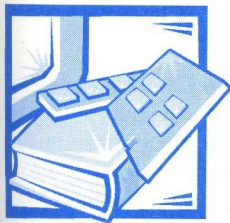
1. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
2. Check the connections in the computer.

Check all power and interface cable connections for the drives. Make sure all cables are securely and properly connected to the system board. Verify that all expansion cards are firmly seated as shown in Figure 6-1 and that all components are properly seated in their connectors and sockets.

3. Replace the computer cover and support beam, and reconnect the system to an electrical outlet.
4. Insert the *Dell Diagnostics Diskette* into drive A, reboot the system, and run the **System Set** test group in the Dell Diagnostics (refer to Chapter 7, "Running the Dell Diagnostics").

If the tests do not complete successfully, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.





## CHAPTER 7

# Running the Dell Diagnostics

The Dell Diagnostics helps you check your computer's hardware without destroying any data. The diagnostic tests can provide you with important information you will need when resolving problems.



**CAUTION:** Use the Dell Diagnostics to test *only* your Dell computer system. Using this program with other computers may cause incorrect computer responses or result in error messages.

The diagnostics provides a series of menus and options from which you choose particular test groups or subtests. You can also control the sequence in which the tests are run. The program also has these helpful features:

- Options that let you run tests individually or collectively
- An option that sets the number of times a test group or subtest runs
- Options to temporarily suspend testing if an error is detected or to end testing when an adjustable error limit is reached
- Status messages that inform you of test group and subtest progress
- Error messages that appear if any problems are detected
- The ability to display or print test results or to save the results in a file

## When to Use the Dell Diagnostics

Use the Dell Diagnostics after you install an upgrade and whenever a major component or device in your computer system does not function properly. As long as the microprocessor and the input and output components of your computer system (the monitor, keyboard, and diskette drive) are working, you can run the Dell Diagnostics. If you are experienced with computers and know what component(s) to test, select the appropriate test group(s) or subtest(s). If you are unsure about how to begin diagnosing a problem, read the rest of this chapter.

## Before You Start Testing

To prepare to run the Dell Diagnostics, make a working copy of the *Dell Diagnostics Diskette* on a blank diskette. Enter the system setup program, confirm your computer's system configuration information, and enable all its components and devices (such as ports). Refer to Appendix B, "System Setup Program," for instructions. Note any changes you make to settings. When you finish running the diagnostics, you should reenter the system setup program and return the settings to their original values.



**NOTE:** Be sure that the **Plug & Play O/S** option is set to **No** in the system setup program **Advanced** menu before running Dell Diagnostics. Otherwise, some diagnostics may incorrectly fail.

## Starting the Dell Diagnostics

To start the diagnostics, follow these steps:

1. Turn off the computer.
2. Insert the diagnostics diskette in the diskette drive, and start the computer system.

When you start the diagnostics, the Dell logo screen appears, followed by a message telling you that the diagnostics is loading.

When the **Diagnostics Menu** appears, highlight an option and press <Enter> or press the key that corresponds to the highlighted letter for that option. Table 7-1 describes the **Diagnostics Menu** options.

**Table 7-1. Diagnostics Menu Options**

| Option                    | Description                                                                                         |
|---------------------------|-----------------------------------------------------------------------------------------------------|
| <b>RUn All Tests</b>      | Provides a thorough check, with certain tests requiring you to respond to prompts                   |
| <b>Run Quick Tests</b>    | Provides a quick check that requires no user interaction                                            |
| <b>RuN Specific Tests</b> | Presents the main screen of the diagnostics (see Figure 7-1), allowing you to choose specific tests |
| <b>Exit To MS-DOS</b>     | Exits to the MS-DOS prompt                                                                          |

## Running the Diagnostics Once

Select **Run All Tests** or **Run Quick Tests** to check the operation of all major features of your computer one time. Select **Run Specific Tests** to run a specific test or tests one time by default. If these checks do not reveal a problem, you may also cycle tests as described in the next subsection, "Cycling the Tests to Catch Intermittent Failures."

## Cycling the Tests to Catch Intermittent Failures

To more thoroughly check your computer or to catch failures that occur only occasionally, select **Run Specific Tests** from the **Diagnostics Menu** and use the **Options** menu to customize the testing. Refer to "Options" found later in this chapter for a description of the **Options** menu. To cycle tests, follow these steps:

1. Start the Dell Diagnostics and select **Run Specific Tests**.
2. Select the **Options** menu.
3. Set the **Number of Times to Repeat Test(s)** parameter.

To cycle tests indefinitely, set this parameter to **0**. The tests continue to run until you press <Ctrl><Break>.

4. To run tests unattended (as for an overnight check), set **Pause for User Response** to **No**.
5. Select the **Run** menu and choose **One**, **Selected**, or **All**.

## Main Screen of the Dell Diagnostics

When you select **Run Specific Tests** from the **Diagnostics Menu**, the main screen of the diagnostics appears (see Figure 7-1). Information is presented in the following areas:

- The top of the screen lists the version number of the diagnostics.
- The **Available Test Groups** area lists the diagnostic test groups in the order they will run if you select **All** from the **Run** menu. Press the up- or down-arrow key to highlight a test group.
- The **System Configuration** area lists the computer's currently detected hardware and some of its relevant settings.
- The menu area at the bottom of the screen lists options you can select and provides information about the option currently highlighted.



Dell Computer Corporation  
Dell Dimension XPS R400 Diagnostics Version X.XX

| Available Test Groups                                                                                                                                                                                                                                                                             | System Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------|-----------------|--------|--------------|-----------------|--------|------------|-------|-------------|----------|------------------|-------|---------------|-------------------|---------|--------|------------------------|---------------|----------------------|-------------------|---|------------------|---|--------------|---|-------------------|------|-------|------|
| <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-bottom: 5px;">RAM</div> System Set<br>Video<br>Keyboard<br>Mouse<br>Diskette Drives<br>IDE (ATA/ATAPI) Devices<br>Serial/Infrared Ports<br>Parallel Ports<br>SCSI Devices<br>Network Interface<br>Audio<br>Other | <table style="width: 100%; border-collapse: collapse;"> <tr><td>Memory</td><td style="text-align: right;">64 MB</td></tr> <tr><td>Secondary Cache</td><td style="text-align: right;">512 KB</td></tr> <tr><td>Processor(s)</td><td style="text-align: right;">1-Pentium(R) II</td></tr> <tr><td>USB(2)</td><td style="text-align: right;">Intel 7112</td></tr> <tr><td>Video</td><td style="text-align: right;">SVGA, 4096K</td></tr> <tr><td>Keyboard</td><td style="text-align: right;">101_Key_American</td></tr> <tr><td>Mouse</td><td style="text-align: right;">PS/2 2-button</td></tr> <tr><td>Diskette Drive(s)</td><td style="text-align: right;">A:1.4MB</td></tr> <tr><td>IDE(0)</td><td style="text-align: right;">8455 MB IBM-DHEA-38451</td></tr> <tr><td>IDE(1) CDROM:</td><td style="text-align: right;">NEC CD-ROM DRIVE:285</td></tr> <tr><td>Serial/IR Port(s)</td><td style="text-align: right;">1</td></tr> <tr><td>Parallel Port(s)</td><td style="text-align: right;">1</td></tr> <tr><td>SCSI Devices</td><td style="text-align: right;">2</td></tr> <tr><td>Network Interface</td><td style="text-align: right;">None</td></tr> <tr><td>Audio</td><td style="text-align: right;">None</td></tr> </table> | Memory | 64 MB | Secondary Cache | 512 KB | Processor(s) | 1-Pentium(R) II | USB(2) | Intel 7112 | Video | SVGA, 4096K | Keyboard | 101_Key_American | Mouse | PS/2 2-button | Diskette Drive(s) | A:1.4MB | IDE(0) | 8455 MB IBM-DHEA-38451 | IDE(1) CDROM: | NEC CD-ROM DRIVE:285 | Serial/IR Port(s) | 1 | Parallel Port(s) | 1 | SCSI Devices | 2 | Network Interface | None | Audio | None |
| Memory                                                                                                                                                                                                                                                                                            | 64 MB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Secondary Cache                                                                                                                                                                                                                                                                                   | 512 KB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Processor(s)                                                                                                                                                                                                                                                                                      | 1-Pentium(R) II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| USB(2)                                                                                                                                                                                                                                                                                            | Intel 7112                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Video                                                                                                                                                                                                                                                                                             | SVGA, 4096K                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Keyboard                                                                                                                                                                                                                                                                                          | 101_Key_American                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Mouse                                                                                                                                                                                                                                                                                             | PS/2 2-button                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Diskette Drive(s)                                                                                                                                                                                                                                                                                 | A:1.4MB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| IDE(0)                                                                                                                                                                                                                                                                                            | 8455 MB IBM-DHEA-38451                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| IDE(1) CDROM:                                                                                                                                                                                                                                                                                     | NEC CD-ROM DRIVE:285                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Serial/IR Port(s)                                                                                                                                                                                                                                                                                 | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Parallel Port(s)                                                                                                                                                                                                                                                                                  | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| SCSI Devices                                                                                                                                                                                                                                                                                      | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Network Interface                                                                                                                                                                                                                                                                                 | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |
| Audio                                                                                                                                                                                                                                                                                             | None                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |       |                 |        |              |                 |        |            |       |             |          |                  |       |               |                   |         |        |                        |               |                      |                   |   |                  |   |              |   |                   |      |       |      |

Main Menu: Run seLect Subtest Options Test\_limits About Key\_help Quit  
Display the Run Menu. Press Q to Quit

NOTE: The options displayed on the screen should reflect the hardware configuration of your computer system.

**Figure 7-1. Dell Diagnostics Main Screen**

## How to Use the Menus

To select a menu option, press the key that corresponds to the capitalized letter in the option. Or you can highlight the option (by pressing the left- or right-arrow key) and press <Enter>.

If you want more information about a test group or subtest, highlight **About** and press <Enter>. After reading the information, press <Esc> to return to the previous screen.



**NOTE:** Before running any test groups or subtests (by selecting **Run**), consider setting global parameters (by selecting **Options**). They offer you greater control over how the testing runs and how test results are reported.

The following subsections explain the **Main Menu** options.

## Run

**Run** displays five options: **One**, **Selected**, **All**, **Key-Help**, and **Quit Menu**. If you select **One**, all the subtests within the highlighted test group are run. If you choose **Selected**, only the selected test groups or the subtests that you selected within the test groups are run. If you select **All**, all the subtests in all the test groups are run.

**Key-Help** displays a list of key controls available.

**Quit Menu** returns you to the **Main Menu**.

## Select

**Select** allows you to select individual test groups to tailor the testing process to your particular needs. You can choose one or more test groups and run them sequentially or individually. When you choose **Select**, five options are displayed: **All**, **One**, **Clear All**, **Key-Help**, and **Quit Menu**.

To select all the test groups, press <Enter> when **All** is highlighted in the **Select** menu.

To select an individual test group, highlight the test group and press the spacebar or highlight **One** and press <Enter>. Press the up- or down-arrow key to change the highlighted test group.

To reverse a test group selection, highlight the test group and press the spacebar. To clear all selections, select **Clear All**.

**Key-Help** displays a list of key controls available. **Quit Menu** returns you to the **Main Menu**.

## Subtest

Most of the test groups consist of several subtests. Use **Subtest** to select individual subtests within the test group(s).

When you select **Subtest**, many of the same options as those on the **Main Menu** are displayed: **Run**, **Select**, **Options**, **Test Limits**, **About**, **Key-Help**, and **Quit Menu**.

## Run Under Subtest

**Run** in the **Subtest** menu displays five options: **One**, **Selected**, **All**, **Key-Help**, and **Quit Menu**. If you select **One**, only the highlighted subtest is run. If you choose **Selected**, only the selected subtests are run. If you select **All**, all of the subtests listed on the screen are run.

**Key-Help** displays a list of key controls available. **Quit Menu** returns you to the previous menu.

### Select Under Subtest

**Select** in the **Subtest** menu allows you to select individual subtests to tailor the testing process to your particular needs. You can choose one or more subtests from the list. When you choose **Select**, five options are displayed: **All**, **One**, **Clear All**, **Key-Help**, and **Quit Menu**.

To select all the subtests, press <Enter> when **All** is highlighted in the **Select** menu. To select an individual subtest, highlight the subtest and press the spacebar or highlight **One** and press <Enter>. Press the up- or down-arrow key to highlight a subtest to be selected.

To reverse a subtest selection, highlight the subtest and press the spacebar. To clear all selections, select **Clear All**.

**Key-Help** displays a list of key controls available. **Quit Menu** returns you to the previous menu.

### Options Under Subtest

**Options** in the **Subtest** menu functions the same as it does in the **Main Menu**. For information on this option, refer to "Options" found later in this chapter.

### Test Limits Under Subtest

**Test Limits** in the **Subtest** menu functions the same as it does in the **Main Menu**. For information on this option, refer to "Test Limits" found later in this chapter.

### About Under Subtest

**About** in the **Subtest** menu displays information about the highlighted subtest.

### Key-Help Under Subtest

**Key-Help** in the **Subtest** menu displays a list of key controls available.

### Quit Menu Under Subtest

**Quit Menu** in the **Subtest** menu returns you to the **Main Menu**.

## Options

Table 7-2 lists the possible values for each global parameter of **Options**. To change **Options** parameters, press the spacebar, the left- and right-arrow keys, or the plus (+) and minus (-) keys.



**Table 7-2. Option Parameters**

| Global Parameter                  | Possible Values                                                | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of Times to Repeat Test(s) | <b>0001</b> through <b>9999</b> .<br>Default is <b>1</b> .     | Specifies the number of times the tests run. To change the default, type a value. If you type 0 (zero), the tests run indefinitely until you press <Ctrl><Break>.                                                                                                                                                                                                                                                                                                                                              |
| Maximum Errors Allowed            | <b>0000</b> through <b>9999</b> .<br>Default is <b>1</b> .     | Specifies the maximum number of errors that can occur before testing is stopped. The error count begins from zero each time you run a subtest, test group, or select <b>All</b> . To change the default, type a value. If you type 0 (zero), there is no error limit.                                                                                                                                                                                                                                          |
| Pause For User Response           | <b>Yes, No</b> .<br>Default is <b>Yes</b> .                    | <p>If the option is set to <b>Yes</b>, the diagnostics pauses when the maximum error limit occurs or when user interaction is needed to complete tests.</p> <p>If the option is set to <b>No</b>, the diagnostics does not pause for subtests that require your interaction and displays the result <b>Not Applicable</b>. Use this parameter when running the diagnostics overnight.</p>                                                                                                                      |
| Output Device for Status Messages | <b>Display, Printer, File</b> .<br>Default is <b>Display</b> . | Directs status messages generated when tests run to the monitor screen, a printer, or a file. If you select <b>Printer</b> , the printer must be attached to the computer, turned on, and in the online mode to print. If you select <b>File</b> , the messages are printed to a file named <b>result</b> on a diskette that you insert into drive A when prompted. If the <b>result</b> file already exists, new status messages are added to it. You can open the file in any text viewer or word processor. |
| Output Device for Error Messages  | <b>Display, Printer, File</b> .<br>Default is <b>Display</b> . | This parameter has the same effect as the <b>Output Device for Status Messages</b> parameter, except that it pertains only to error messages.                                                                                                                                                                                                                                                                                                                                                                  |

## Test Limits



*NOTE: The Dell Diagnostics sets default limits on all tests. Change these defaults if you want to limit or expand the amount of testing done.*

The **RAM** test group, the **Video** test group, the **Diskette Drives** test group, the **IDE (ATA/ATAPI)** test group, the **Serial/Infrared Ports** test group, the **Parallel Ports** test group, and the **SCSI Devices** test group allow you to designate limits. Whether you select **Test Limits** for a highlighted test group (from the **Main Menu**) or a subtest (from the **Subtest** menu), you set the limits for all the subtests in that test group. When you select **Test Limits**, a new screen appears and the **Key-Help** area lists keys to use with the new screen. Press <Page Down> to select the next menu or sub-menu. Press <Esc> to return to the main **Test Limits** window.

How you change a value for the limits of a test group or subtest depends on the type of parameter associated with it. Different keys are used to change values for different types of parameters. For example, memory address limits specified for the **RAM** test group are changed by typing numbers over the digits of a given limit or by pressing the plus (+) or minus (-) keys to increase or decrease the given limit. In contrast, to set limits for the **Serial/Infrared Ports** test group, you use the spacebar to toggle between **Yes** and **No**.

When you are satisfied with the limits, return to the Dell Diagnostics main screen by pressing the <Esc> key. The values you selected under **Test Limits** remain in effect for all the test groups or subtests you run, unless you change them. However, the values are reset to their defaults when you restart the diagnostics.

## About

**About** in the **Main Menu** lists all of the subtests for the selected test group and displays information about the subtest that is highlighted.

## Key-Help

**Key-Help** displays a list of key controls available for the selected option.

## Quit

Selecting **Quit** from the **Main Menu** exits the diagnostics. When you return to the operating system environment, remove the diagnostics diskette from drive A and reboot the system.



**CAUTION: It is important that you quit the diagnostics correctly because the program writes data to the computer's memory that can cause problems unless properly cleared.**

## Diagnostics Tests

To troubleshoot components or devices, run the appropriate test (test group or subtest) in the diagnostics. The diagnostics is organized by components into test groups and subtests within each test group. Each subtest is designed to detect any errors that may interfere with the normal operation of a specific computer device.



**CAUTION: Some tests may fail if you have hardware that is not supported by your version of the diagnostics; if a component is functioning normally, a diagnostics test failure may not indicate a problem.**



**NOTE:** Some subtests requiring hardware not listed in the System Configuration area of the main screen appear to run, but they conclude with a status message stating Component not present (or disabled).

## RAM Test Group

Table 7-3 lists the tests in the **RAM** test group. If the computer has any of the following symptoms, run the **RAM** test group:

- A program is not running as usual, or a proven piece of software appears to malfunction and you confirm that the software itself is not at fault by running it on another computer.
- The computer periodically locks up (becomes unusable and must be rebooted), especially at different times in various programs.
- Parity errors occur during operation. Record the referenced address on a copy of the Diagnostics Checklist (provided in Chapter 8, "Getting Help").

**Table 7-3. RAM Test Group**

| Test                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Quick Memory</b>         | Performs an address check on all available RAM to make sure that the system properly sets and clears individual bits in RAM. Also determines if RAM read and write operations affect more than one memory address location at a time.                                                                                                                                                                                                       |
| <b>Comprehensive Memory</b> | Does the following: <ul style="list-style-type: none"><li>• Address check.</li><li>• Data pattern checks that look for RAM bits that are stuck high or low, short-circuited data lines, and some data pattern problems that are internal to the memory chips.</li><li>• Parity check to verify the ability of the memory subsystem to detect errors.</li><li>• Refresh check to verify that the DRAM is being recharged properly.</li></ul> |
| <b>Cache RAM</b>            | Confirms the functionality of the computer's cache memory.                                                                                                                                                                                                                                                                                                                                                                                  |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## System Set Test Group

The **System Set** test group double-checks many system board components, some of which are tested by other test groups and others which are not. Table 7-4 lists the tests in the **System Set** test group.

The following symptoms usually warrant running a **System Set** test:

- A program is not running as usual, or a proven piece of software appears to malfunction and you confirm that the software itself is not at fault by running it on another computer without problems.



- An expansion card you previously accessed can no longer be accessed.
- Parity errors or page fault failures occur. Record the referenced address on a copy of the Diagnostics Checklist (provided in Chapter 8, "Getting Help").
- Correcting errors in the system setup program does not resolve a problem.
- The computer's clock/calendar stops or the speaker no longer functions. Run the **Timers Test**, followed by the **Speaker Test**.
- If an external device appears to malfunction, run the **Interrupt Controller Test**.
- A spreadsheet program or other type of mathematical application program runs slowly or incorrectly, generates error messages concerning calculations or operations, or generates incorrect results.
- The computer periodically locks up, especially at different times in various programs, or halts in the middle of performing complex operations.

**Table 7-4. System Set Test Group**

| Test                        | Description                                                                                                                                                                                                            |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CMOS Confidence</b>      | Performs a data pattern check and verifies memory addresses. Checks the NVRAM for accessibility and the reliability of data storage.                                                                                   |
| <b>DMA Controller</b>       | Tests the DMA controller and verifies the correct operation of its page and channel registers by writing patterns to the registers.                                                                                    |
| <b>Real-Time Clock</b>      | Confirms the functionality and accuracy of the RTC.                                                                                                                                                                    |
| <b>Timers</b>               | Checks the timers used by the microprocessor for event counting, frequency generation, and other functions. Tests only functions that can be activated by software.                                                    |
| <b>Interrupt Controller</b> | Generates an interrupt on each IRQ line to verify that devices using that line can communicate with the microprocessor and that the interrupt controllers can send the correct memory addresses to the microprocessor. |
| <b>Speaker</b>              | Generates eight tones to check the functionality of the speaker.                                                                                                                                                       |
| <b>X87 Calculation</b>      | Checks the use of different types of numbers and the math coprocessor's ability to calculate correctly.                                                                                                                |
| <b>X87 Error Exception</b>  | Verifies the math coprocessor's ability to handle errors and to send IRQs to the microprocessor.                                                                                                                       |
| <b>USB Register</b>         | Checks the onboard registers of the USB interface. It does <i>not</i> test USB devices.                                                                                                                                |
| <b>USB Memory Structure</b> | Monitors the ability of a USB controller to process a set of memory-resident instructions.                                                                                                                             |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## Video Test Group

The **Video** test group verifies the proper operation of the video controller and the video control circuitry. The group also tests all the video memory and checks the color features of a color monitor.

Before you run the **Video** test group, make sure that the problem is not in the software or caused by a hardware change. If the following symptoms still occur, run the appropriate tests as described in Table 7-5:

- If your monitor shows a partially formed or distorted image, run *all* of the subtests in the **Video** test group.
- If the alignment of text or images is *off*, regardless of the program you are running, run the **Text Mode Character**, **Text Mode Pages**, and **Graphics Mode** tests.
- If you have a color monitor or a program that runs in color, but the color is intermittent or not displayed at all, run the **Text Mode Color**, **Color Palettes**, and **Solid Color** tests.
- If your monitor malfunctions in one mode but works fine in another (for example, text is displayed correctly, but graphics are not) run the **Text Mode Character**, **Text Mode Color**, **Text Mode Pages**, and **Graphics Mode** tests.



**NOTE:** The default limit for testing super video graphics array (SVGA) modes is **No**. If you are testing with an SVGA-capable monitor, change the default to **Yes** to test the entire video subsystem.

**Table 7-5. Video Test Group**

| Test                       | Description                                                                                                                 |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Video Memory</b>        | Checks the read/write capability of video memory in various video modes.                                                    |
| <b>Video Hardware</b>      | Checks the cursor registers and the horizontal and vertical retrace bit registers in the video controller.                  |
| <b>Text Mode Character</b> | Checks the video subsystem's ability to present data in text modes.                                                         |
| <b>Text Mode Color</b>     | Checks the video subsystem's ability to present color in text modes.                                                        |
| <b>Text Mode Pages</b>     | Checks the video subsystem's ability to map and present all available video pages on the screen, one page at a time.        |
| <b>Graphics Mode</b>       | Checks the video subsystem's ability to present color graphics images.                                                      |
| <b>Color Palettes</b>      | Checks the video subsystem's ability to display all of the available colors.                                                |
| <b>Solid Colors</b>        | Checks the video subsystem's ability to show screens full of solid colors. Allows you to check for missing color subpixels. |

All of the tests, except the **Video Memory** and **Video Hardware** tests, are interactive. In the interactive tests, examine each displayed image. Type **y** if an image is correct or type **n** if it is not.

## Keyboard Test Group

The **Keyboard** test group verifies the correct operation of your keyboard and the keyboard controller chip.

Keyboard problems are not always caused by the keyboard. For example, a complete lockup of the computer system, which includes an inoperable keyboard, is probably caused elsewhere. The configuration of a program can change the function of a key or key combination. When a key does not work at all, run all the tests in the **Keyboard** test group (described in Table 7-6).



*NOTE: If the keyboard presented for the **Key Sequence** and **Interactive** tests does not match your keyboard, press <Enter> twice to begin cycling through available keyboard maps. Press <Esc> to view the next map, and press <Enter> to accept the map that matches your keyboard.*

**Table 7-6. Keyboard Test Group**

| Test                | Description                                                                                                                          |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <b>Controller</b>   | Confirms that the keyboard controller chip can communicate with the keyboard and checks the programming of the controller chip.      |
| <b>Key Sequence</b> | Verifies that the keys on the keyboard function correctly when you press the keys in a predefined order.                             |
| <b>Interactive</b>  | Checks the internal microcode of the keyboard and the external interface of the keyboard controller chip for a malfunctioning key.   |
| <b>Stuck Key</b>    | Checks the internal microcode of the keyboard and the external interface of the keyboard controller chip for a repeating key signal. |

## Mouse Test

The **Mouse** test checks the functionality of the mouse controller and the operation of the mouse buttons.

Mouse problems are as likely to originate in random-access memory (RAM) as they are to be caused by a faulty mouse. Three sources of RAM-related problems include the configuration of a program (which changes the function of the mouse), memory-resident programs, and failure of a device driver (the software that controls the function of the mouse). If you have eliminated these possibilities and the following symptoms persist, run the **Mouse** test:

- When you press a mouse button, the function of the button continues; that is, the button seems to be stuck.



- If the response when you press a mouse button is different from the usual or anticipated response, the button contact may be damaged.
- A mouse button does not work at all.
- The cursor does not respond on the screen in accordance with the movements you make with the mouse.

## **Diskette Drives Test Group**

The **Diskette Drives** test group tests both 5.25-inch and 3.5-inch diskette drives. The tests are listed in Table 7-7.

A diskette drive problem can appear to be a diskette problem because defective diskettes produce faulty-drive error messages. Dell recommends running the **Diskette Drives** test group more than once using diskettes from different sources.

The following symptoms usually suggest a drive problem and warrant running a test in the **Diskette Drives** test group:

- An error message appears on the screen stating that the computer cannot *read* from or *write* to a diskette.
- A diskette cannot be properly formatted, or format error messages appear on the screen.
- Data on diskettes is corrupted or lost; these problems may be intermittent.

**Table 7-7. Diskette Drives Test Group**

| Test               | Description                                                                                                                                          |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Change Line</b> | Checks for bent pins on the diskette drive controller and for defective lines on the diskette cable.                                                 |
| <b>Seek</b>        | Checks the drive's ability to search for a specified track on the diskette and to position its read/write heads to all tracks.                       |
| <b>Read</b>        | Positions the read/write heads at each cylinder of the diskette for reading data and verifies that all tracks on the diskette can be read correctly. |
| <b>Write</b>       | Positions the read/write heads at each cylinder of the diskette and verifies that all tracks on the diskette can be written to correctly.            |

## **IDE (ATA/ATAPI) Devices Test Group**

The **IDE (ATA/ATAPI) Devices** test group checks the functionality of up to four devices (two on each channel) of any capacity as well as the hard-disk drive controller. Table 7-8 lists the test group options.

If you check a hard-disk drive to determine the amount of available space, your operating system will probably report problem areas. Most hard-disk drives have a small amount of space that is not usable. Identification of unusable disk space, unless it is

an unusually large amount (over 5 percent of the possible total), should not be regarded as a cause for testing the hard-disk drive.

If you encounter a problem while using an application program on a CD, the problem could result from the disc or from the drive. When you encounter problems, first try using a different CD. If the problem recurs, run the **IDE (ATA/ATAPI) Devices** test group.

These are the most common symptoms that might prompt you to test IDE devices:

- The hard-disk drive fails during the boot routine.
- *Seek* errors are reported by the operating system or application programs.
- An error message appears on the screen stating that the computer cannot *read* from or *write* to a device.
- Data on a hard-disk drive is corrupted or lost; saved files cannot be properly recalled. These problems may be intermittent.



**NOTES:** Before conducting these tests on CD-ROM drives, insert a CD with audio and data tracks (such as a multimedia CD) into each CD-ROM drive. All of the subtests except for the **Audio Test** require a CD with data tracks. The **Audio Test** requires a CD with audio tracks and either on-board audio or a Dell-supported sound card.

If a CD-ROM drive is empty, or if it contains a CD that does not have the required data or audio tracks (depending on the tests you are running), the tests will fail.



**CAUTION:** If you test a tape drive, the data on the tape will be destroyed.

**Table 7-8. IDE (ATA/ATAPI) Devices Test Group**

| Option                       | Description                                                                                                                                                           |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Display Information</b>   | Displays configuration information about an attached device.                                                                                                          |
| <b>Self Diagnostics Test</b> | Causes a drive to execute its internal self-test.                                                                                                                     |
| <b>Seek Test</b>             | Checks a drive's ability to search for each block on the device.                                                                                                      |
| <b>Read Test</b>             | Positions the read/write heads at each block of the device for reading data and allows the diagnostics to verify that all tracks on the device can be read correctly. |
| <b>Verify Test</b>           | Positions the read/write heads at each cylinder of a drive for reading data and allows the drive to verify that all tracks on the drive can be read correctly.        |
| <b>Write Test</b>            | Positions the read/write heads at each cylinder of a writable device and verifies that all tracks on the drive can be written to correctly.                           |

**NOTE:** The Glossary in the Online Guide defines abbreviations and acronyms.

**Table 7-8. IDE (ATA/ATAPI) Devices Test Group** (continued)

| Option                  | Description                                                                                                                                                                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Audio Test</b>       | Causes the drive to begin playing the first audio track on an audio CD. To determine whether the test passed, listen to the audio output of the drive.<br><br><i>NOTE: To conduct the <b>Audio Test</b>, you must select it individually. It will not run as part of the test group.</i> |
| <b>S.M.A.R.T. Test</b>  | Retrieves the status (pass/fail) of SMART-capable drives.                                                                                                                                                                                                                                |
| <b>Media Eject Test</b> | Checks a drive's ability to eject its removable media.                                                                                                                                                                                                                                   |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## Serial/Infrared Ports Test Group

The **Serial/Infrared Ports** test group checks the computer's interface with a device connected to the computer through the serial port. It does not test the device itself. Table 7-9 lists the tests.

If the Dell Diagnostics does not recognize your computer's serial port, enter the system setup program and verify that the serial port is enabled. The **Serial/Infrared Ports** test group cannot test a port unless it is enabled.

When a port is faulty, first make sure that the device connected to the port is functioning properly. Use the documentation that came with the device to troubleshoot it and confirm that it is working properly. Try operating the device from different programs or through the operating system to eliminate the software configuration as the cause of the problem.

After you eliminate incorrect system configuration settings, device malfunctions, and software errors as potential causes of port problems, you can run the **Serial/Infrared Ports** test group to check your hardware. Although faulty devices or software errors may cause the following symptoms, they also suggest a port problem:

- If a device works intermittently or produces intermittent errors, the port may be faulty.
- If the computer displays an error message that is related to the device connected to the serial port, but corrections to the device do not resolve the error, run the **Serial/Infrared Ports** test group.
- If your software and the diagnostics do not recognize that you have a serial port, even though the serial port is enabled in the system setup program, run the **Serial/Infrared Ports** test group.

*NOTES: With certain modems installed, the **Serial/Infrared Ports** test group sub-tests may fail because the modem appears to the Dell Diagnostics as a serial port, but it cannot be tested as a serial port. If a modem is installed and the serial port tests fail, remove the modem and run the diagnostics again.*





If an external loopback connector (a special Dell manufacturing device) is not attached to a serial port, the **External Transmission** test will fail for that port and the results of this test should therefore be ignored. An external modem connected to the port does not substitute for an external loopback connector.

**Table 7-9. Serial/Infrared Ports Test Group**

| Test                         | Description                                                                                                                                                        |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Baud Rate</b>             | Checks the baud rate generator in each serial communications chip against the computer's clock.                                                                    |
| <b>Interrupt</b>             | Checks the serial port's ability to send IRQs to the microprocessor.                                                                                               |
| <b>Internal Transmission</b> | Checks several internal functions of the serial port using the internal loopback mode of the serial communications chip.                                           |
| <b>External Transmission</b> | If a loopback connector is attached, checks the line control bits of the serial port and sends a test pattern at several baud rates, checking the returned values. |

## Parallel Ports Test Group

The **Parallel Ports** test group checks the computer's interface with a device connected to the computer through the parallel port. It does not test the device itself, except for the **Printer Pattern Test**. Table 7-10 lists the tests.

If the Dell Diagnostics does not recognize your computer's parallel port, enter the system setup program and verify that the parallel port is enabled. The **Parallel Ports** test group cannot test a port unless it is enabled.

When a port is faulty, first make sure that the device connected to the port functions properly. Use the documentation that came with the device to troubleshoot it and confirm that it is working properly. Try operating the device from different programs or through the operating system to eliminate the software configuration as the cause of the problem.

After you eliminate incorrect system configuration settings, device malfunctions, and software errors as potential causes of port problems, run the **Parallel Ports** test group to check the system hardware. Although faulty devices or software errors may cause the following symptoms, they also suggest a port problem:

- If a device works intermittently or produces intermittent errors, the port may be faulty.
- If the computer displays an error message that is related to the external device connected to a port, but corrections to the device do not resolve the error, run the appropriate test in the **Parallel Ports** test group.
- If your software and the Dell Diagnostics do not recognize that you have a parallel port, you should check **Parallel Port** in the system setup program, and if necessary, run the appropriate test in the **Parallel Ports** test group.



*NOTE: If an external loopback connector (a special Dell manufacturing device) is not attached to the parallel port, the **External Loopback** test will fail for that port and the results of this test should therefore be ignored.*

**Table 7-10. Parallel Ports Test Group**

| Test                      | Description                                                                                                                                   |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Internal</b>           | Checks several internal functions of the parallel port.                                                                                       |
| <b>External Loopback</b>  | Tests the functionality of the control lines through an external loopback connector (if one is attached).                                     |
| <b>External Interrupt</b> | Tests the parallel port's ability to generate interrupts from all possible sources, if an external loopback connector or printer is attached. |
| <b>Printer Pattern</b>    | Tests a printer and the parallel port's ability to send a pattern to the printer (if connected).                                              |

## **SCSI Devices Test Group**

The **SCSI Devices** test group checks the functionality of up to four small computer system interface (SCSI) host adapters and all the SCSI devices attached to them. Table 7-11 lists the test group options.

If you check your SCSI hard-disk drive to determine the amount of available space, your operating system will probably report problem areas. Most hard-disk drives have a small amount of space that is not usable. Identification of unusable disk space, unless it is an unusually large amount (over 5 percent of the possible total), should not be regarded as a cause for testing the hard-disk drive.

If you encounter a problem while using an application program on a CD, the problem could result from the disc or from the drive. When you encounter problems, first try using a different CD. If the problem recurs, run the **SCSI Devices** test group.

These are the most common symptoms that might prompt you to test a SCSI device:

- A SCSI hard-disk drive fails during the boot routine.
- *Seek* errors are reported by the operating system or application programs.
- An error message appears on the screen stating that the computer cannot *read* from or *write* to a SCSI device.
- Data on a SCSI device is corrupted or lost; saved files cannot be properly recalled. This problem may be intermittent.



*NOTES: Before conducting these subtests on CD-ROM drives, insert a CD with audio and data tracks (such as a multimedia CD) into each CD-ROM drive. All of the tests, except for the **Audio Test**, require a CD with data tracks. The **Audio Test** requires a CD with audio tracks.*

*If a CD-ROM drive is empty or if it contains a CD that does not have the required data or audio tracks (depending on the tests you are running), the tests will fail.*



**CAUTION: If you test a tape drive, the data on the tape will be destroyed.**

**Table 7-11. SCSI Devices Test Group**

| Option                       | Description                                                                                                                                                                                                                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Display Information</b>   | Displays information about each SCSI host adapter in the computer, the resources allocated to each adapter, and a list of target devices attached to each adapter.                                                                                                                              |
| <b>Device Self Test</b>      | Causes the device to run its internal self-test.                                                                                                                                                                                                                                                |
| <b>Seek Test</b>             | Checks a device's ability to search for each block on the device.                                                                                                                                                                                                                               |
| <b>Verify Test</b>           | Positions the read/write heads at each cylinder of a drive for reading data and allows the drive to verify that all tracks on the drive can be read correctly.                                                                                                                                  |
| <b>Read Test</b>             | Positions the read/write heads at each block of the device for reading data and allows the diagnostics to verify that all tracks on the device can be read correctly.                                                                                                                           |
| <b>Write Test</b>            | Positions the read/write heads at each cylinder of a writable device and verifies that all tracks on the drive can be written to correctly.                                                                                                                                                     |
| <b>Audio Test</b>            | Causes the CD-ROM drive to begin playing the first audio track on an audio CD. To determine whether the test passed, listen to the audio output of the drive.<br><br><i>NOTE: To conduct the <b>Audio Test</b>, you must select it individually. It will not run as part of the test group.</i> |
| <b>Eject Removable Media</b> | Checks a drive's ability to eject its removable media.                                                                                                                                                                                                                                          |

## **Network Interface Test Group**

The **Network Interface** test group helps diagnose problems that may be encountered while the system is operating in a network environment. Table 7-12 lists the tests.

Most network failures are caused by one of the following problems:

- Poor network connections
- Failure of the network interface controller (NIC)
- Interrupt conflict (the controller trying to use the same interrupt request [IRQ] line as another device)
- Software configuration error



If a problem occurs while the system is operating in a network, the network connection should be inspected. If the connection is good, run the **Network Interface** test group to indicate whether the NIC is functioning. If the test group is run in a loop, it can detect intermittent failures.



*NOTE: The **Network Interface** test group functions only with certain network cards purchased from Dell. For some NICs, not all tests are applicable.*

**Table 7-12. Network Interface Test Group**

| Option                        | Description                                                                                                                                                                                                                                                         |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Registers Test</b>         | Writes patterns to the writable registers in the NIC and reads the patterns back to verify whether they are accessible and able to retain data. This test also checks interrupt generation capability and register-specific functionality based on the type of NIC. |
| <b>Shared RAM Test</b>        | Performs a memory test on NICs with memory-mapped shared RAM. For NICs with FIFO-shared RAM, this test writes a data pattern to all locations and reads the pattern back to verify the operation.                                                                   |
| <b>Internal Loopback Test</b> | Places the NIC into its various internal loopback modes and tests its ability to transmit and receive data.                                                                                                                                                         |
| <b>External Loopback Test</b> | Places the NIC into its various external loopback modes and tests its ability to transmit and receive data. A loopback connector is required to perform this test.                                                                                                  |
| <b>Display Information</b>    | Displays addresses and configuration information about the NIC, including the network address used for communication on the LAN.                                                                                                                                    |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## Audio Test Group

The **Audio** test group checks the functions of the audio controller and the computer's recording and playback features. Table 7-13 lists the tests.

In the absence of an expected sound, first check the documentation that came with your operating system or audio program to determine if the sound features are correctly configured. If you still do not hear sound, run the **Audio** test group.



*NOTES: Before running the **Audio** test group, make sure the speakers are connected correctly and turned on. Set the speaker volume to mid-range.*

*The **Audio** test group functions only with the optional on-board audio controller and with certain sound cards purchased from Dell. For some sound cards, not all tests are applicable.*

**Table 7-13. Audio Test Group**

| Test                         | Description                                                                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Software Reset</b>        | Checks for the presence of an active audio controller in your system.                                                                           |
| <b>Interrupt</b>             | Checks if the audio controller is generating an interrupt on the IRQ line configured for that controller.                                       |
| <b>DMA</b>                   | Tests for the presence of a DMA channel on the system chip set, and determines if the DMA controller and audio controller can exchange signals. |
| <b>FM Sound Playback</b>     | Tests whether the system can synthesize sounds and play them through the speakers.                                                              |
| <b>Analog Sound Playback</b> | Tests whether the system can play sampled sounds through the speakers.                                                                          |
| <b>Record and Playback</b>   | Checks the ability of the audio controller to generate a sampled sound from signals received from the microphone (if connected).                |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*



## CHAPTER 8

### Getting Help

This chapter describes the tools Dell provides to help you when you have a problem with your computer. It also tells you when and how to call Dell for technical or customer assistance.

### Technical Assistance

If you need assistance with a technical problem, perform the following steps:

1. Complete the troubleshooting checks in Chapter 4, "Basic Troubleshooting."
2. Run the Dell Diagnostics as described in Chapter 7, "Running the Dell Diagnostics."
3. Make a copy of the Diagnostics Checklist (found later in this chapter), and fill it out.
4. Use Dell's extensive suite of online services available at Dell's World Wide Web site (<http://www.dell.com>) for help with installation and troubleshooting procedures.

For more information, refer to "World Wide Web on the Internet" found later in this chapter.

5. If the preceding steps have not resolved the problem and you need to talk to a Dell technician, you can call Dell's technical support service.

When prompted by Dell's automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.

*NOTE: Dell's Express Service Code may not be available in all countries.*

For instructions on using the technical support service, refer to "Technical Support Service" and "Before You Call" found later in this chapter.





## Help Tools

Dell provides a number of tools to assist you. These tools are described in the following sections.



*NOTE: Some of the following tools are not always available in all locations outside the continental U.S. Please call your local Dell representative for information on availability.*

## World Wide Web on the Internet

The Internet is your most powerful tool for obtaining information about your computer and other Dell products. Through the Internet, you can access most of the other services described in this chapter, including AutoTech, TechFax, order status, technical support, and product information.



From Dell's World Wide Web home page ([www.dell.com](http://www.dell.com)), click the **Support** icon. Everything you need to know about your system is presented in the support area. When prompted on any page, enter your service tag (or, if you have one, your Express Service Code) and click **Submit** to see information specific to your system. If you don't have your service tag or Express Service Code available, you can also select support information by system.

Information available in the support area includes the following:

- Technical information — Details on every aspect of your system, including hardware specifications.
- Self-diagnostic tools — System-specific troubleshooting to resolve many computer-related issues by following interactive flowcharts.
- Drivers, files, and utilities — The latest drivers and basic input/output system (BIOS) updates to keep your system functioning at its best.
- Component support — Technical information, documentation, and troubleshooting tips for different system components.
- Communications with Dell — Submit requests for both technical and nontechnical information on Dell products. Avoid telephone delays with e-mail response to your request for information if your computer is not functioning properly or if you have questions regarding your computer's hardware or operation.

Dell can be accessed electronically using the following addresses:

- World Wide Web site  
**<http://www.dell.com>**  
**<http://www.dell.com/intl/apcc>** (for Asian/Pacific countries only)  
**<http://www.dell.com/euro>** (for Europe only)
- Anonymous file transfer protocol (FTP) site  
**<ftp.dell.com>**

Log in as user: `anonymous`, and use your e-mail address as your password.

- Electronic Support Service  
**support@us.dell.com**  
**apsupport@dell.com** (for Asian/Pacific countries only)
- Electronic Quote Service  
**sales@dell.com**  
**apmarketing@dell.com** (for Asian/Pacific countries only)
- Electronic Information Service  
**info@dell.com**

### **AutoTech Service**

Dell's automated technical support service—AutoTech—provides recorded answers to the questions most frequently asked by Dell customers.

When you call AutoTech, you use your touch-tone telephone to select the subjects that correspond to your questions. You can even interrupt an AutoTech session and continue the session later. The code number that the AutoTech service gives you allows you to continue your session where you ended it.

The AutoTech service is available 24 hours a day, seven days a week. You can also access this service through the technical support service. For the telephone number to call, refer to "Dell Contact Numbers" found later in this chapter.

### **TechFax Service**

Dell takes full advantage of fax technology to serve you better. Twenty-four hours a day, seven days a week, you can call the Dell TechFax line toll-free for all kinds of technical information.

Using a touch-tone phone, you can select from a full directory of topics. The technical information you request is sent within minutes to the fax number you designate. For the TechFax telephone number to call, refer to "Dell Contact Numbers" found later in this chapter.

### **TechConnect BBS**

Use your modem to access Dell's TechConnect bulletin board service (BBS) 24 hours a day, seven days a week. The service is menu-driven and fully interactive. The protocol parameters for the BBS are 1200 to 19.2K baud, 8 data bits, no parity, 1 stop bit.

### **Automated Order-Status System**

You can call this automated service to check on the status of any Dell products that you have ordered. A recording prompts you for the information needed to locate and report on your order. For the telephone number to call, refer to "Dell Contact Numbers" found later in this chapter.

## Technical Support Service

Dell's industry-leading hardware technical support service is available 24 hours a day, seven days a week, to answer your questions about Dell hardware.

Our technical support staff pride themselves on their track record: more than 90 percent of all problems and questions are handled in just one toll-free call, usually in less than ten minutes. When you call, our experts can refer to records kept on your Dell system to better understand your particular question. Our technical support staff use computer-based diagnostics to provide fast, accurate answers to questions.

To contact Dell's technical support service, first refer to the section titled "Before You Call" and then call the number for your country as listed in "Dell Contact Numbers" found later in this chapter. (For information about receiving technical assistance in the U.K., refer to the *Placing a Service Call* card that came with your computer.)

## Problems With Your Order

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell Computer Corporation for customer assistance. Have your invoice or packing slip handy when you call. For the telephone number to call, refer to "Dell Contact Numbers" found later in this chapter.

## Product Information

If you need information about additional products available from Dell Computer Corporation, or if you would like to place an order, visit Dell's World Wide Web site at **<http://www.dell.com>**. For the telephone number to call to speak to a sales specialist, refer to "Dell Contact Numbers" found later in this chapter.

## Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

1. Call Dell to obtain an authorization number, and write it clearly and prominently on the outside of the box.

For the telephone number to call, refer to "Dell Contact Numbers" found later in this chapter.

2. Include a copy of the invoice and a letter describing the reason for the return.
3. Include a copy of the Diagnostics Checklist indicating the tests you have run and any error messages reported by the Dell Diagnostics.
4. Include any accessories that belong with the item(s) being returned (power cables, software diskettes, guides, and so on) if the return is for credit.



5. Pack the equipment to be returned in the original (or equivalent) packing materials.

You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell Computer Corporation. Collect on delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at our receiving dock and returned to you.

## Before You Call



*NOTE: Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.*

Remember to fill out the Diagnostics Checklist (Figure 8-1). If possible, turn on your system before you call Dell for technical assistance and call from a telephone at or near the computer. You may be asked to type some commands at the keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the computer system itself. Make sure the system documentation is available.



**WARNING: If you need to remove the computer cover and support beam, be sure to first disconnect the computer system's power and modem cables from all electrical outlets.**

### Diagnostics Checklist

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Address: \_\_\_\_\_ Phone number: \_\_\_\_\_

Service tag (bar code on the back of the computer): \_\_\_\_\_

Express Service Code: \_\_\_\_\_

Return Material Authorization Number (if provided by Dell support technician): \_\_\_\_\_

Operating system and version: \_\_\_\_\_

Devices: \_\_\_\_\_

\_\_\_\_\_

Expansion cards: \_\_\_\_\_

\_\_\_\_\_

Are you connected to a network? ☐ yes ☐ no

Network, version, and network card: \_\_\_\_\_

Programs and versions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Refer to your operating system documentation to determine the contents of the system's start-up files. If the computer is connected to a printer, print each file. Otherwise, record the contents of each file before calling Dell.

Error message, beep code, or diagnostic code: \_\_\_\_\_

Description of problem and troubleshooting procedures you performed: \_\_\_\_\_

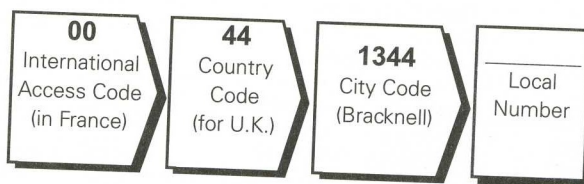
\_\_\_\_\_

\_\_\_\_\_

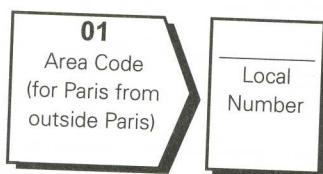
**Figure 8-1. Diagnostics Checklist**

## Dell Contact Numbers

When you need to contact Dell, use the telephone numbers and codes provided in Tables 8-1 and 8-2. Table 8-1 provides the various codes required to make long-distance and international calls. Table 8-2 provides local telephone numbers, area codes, and toll-free numbers, if applicable, for each department or service available in various countries around the world. If you are making a direct-dialed call to a location outside of your local telephone service area, determine which codes to use (if any) in Table 8-1 in addition to the local numbers provided in Table 8-2. For example, to place an international call from Paris, France to Bracknell, England, dial the international access code for France followed by the country code for the U.K., the city code for Bracknell, and then the local number as shown in the following illustration.



To place a long-distance call within your own country, use area codes instead of international access codes, country codes, and city codes. For example, to call Paris, France from Montpellier, France, dial the area code plus the local number as shown in the following illustration.



The codes required depend on where you are calling from as well as the destination of your call; in addition, each country has a different dialing protocol. If you need assistance in determining which codes to use, contact a local or an international operator.



**NOTE:** Toll-free numbers are for use only within the country for which they are listed. Area codes are most often used to call long distance within your own country (not internationally)—in other words, when your call originates in the same country you are calling.



**Table 8-1. International Dialing Codes**

| <b>Country (City)</b>        | <b>International Access Code</b> | <b>Country Code</b> | <b>City Code</b> |
|------------------------------|----------------------------------|---------------------|------------------|
| Australia (Sydney)           | 0011                             | 61                  | 2                |
| Austria (Vienna)             | 900                              | 43                  | 1                |
| Belgium (Brussels)           | 00                               | 32                  | 2                |
| Brunei                       | —                                | 673                 | —                |
| Canada (North York, Ontario) | 011                              | —                   | Not required     |
| Chile (Santiago)             | —                                | 56                  | 2                |
| China (Xiamen)               | —                                | 86                  | 592              |
| Czech Republic (Prague)      | 00                               | 420                 | 2                |
| Denmark (Horsholm)           | 009                              | 45                  | Not required     |
| Finland (Helsinki)           | 990                              | 358                 | 9                |
| France (Paris) (Montpellier) | 00                               | 33                  | (1) (4)          |
| Germany (Langen)             | 00                               | 49                  | 6103             |
| Hong Kong                    | 001                              | 852                 | Not required     |
| Ireland (Bray)               | 16                               | 353                 | 1                |
| Italy (Milan)                | 00                               | 39                  | 2                |
| Japan (Kawasaki)             | 001                              | 81                  | 44               |
| Korea (Seoul)                | 001                              | 82                  | 2                |
| Luxembourg                   | 00                               | 352                 | —                |
| Macau                        | —                                | 853                 | Not required     |
| Malaysia (Penang)            | 00                               | 60                  | 4                |
| Mexico (Colonia Granada)     | 95                               | 52                  | 5                |
| Netherlands (Amsterdam)      | 00                               | 31                  | 20               |
| New Zealand                  | 00                               | 64                  | —                |
| Norway (Lysaker)             | 095                              | 47                  | Not required     |
| Poland (Warsaw)              | 011                              | 48                  | 22               |
| Singapore (Singapore)        | 005                              | 65                  | Not required     |
| South Africa (Johannesburg)  | 09/091                           | 27                  | 11               |
| Spain (Madrid)               | 07                               | 34                  | 1                |

**Table 8-1. International Dialing Codes** (continued)

| Country (City)          | International Access Code | Country Code | City Code    |
|-------------------------|---------------------------|--------------|--------------|
| Sweden (Upplands Vasby) | 009                       | 46           | 8            |
| Switzerland (Geneva)    | 00                        | 41           | 22           |
| Taiwan                  | 002                       | 886          | —            |
| Thailand                | 001                       | 66           | —            |
| U.K. (Bracknell)        | 010                       | 44           | 1344         |
| U.S.A. (Austin, Texas)  | 011                       | 1            | Not required |

**Table 8-2. Dell Contact Numbers**

| Country (City)                                                                                                                         | Department Name or Service                                            | Area Code | Local Number or Toll-Free Number |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------|----------------------------------|
| <b>Australia</b><br>(Sydney)                                                                                                           | Customer Technical Support<br>(Dell Dimension systems only) . . . . . |           | 1-300-65-55-33                   |
|                                                                                                                                        | Customer Technical Support (Other systems) . . . . .                  |           | toll free: 1-800-633-559         |
|                                                                                                                                        | Customer Care . . . . .                                               |           | toll free: 1-800-819-339         |
|                                                                                                                                        | Corporate Sales . . . . .                                             |           | toll free: 1-800-808-385         |
|                                                                                                                                        | Transaction Sales . . . . .                                           |           | toll free: 1-800-808-312         |
|                                                                                                                                        | Fax . . . . .                                                         |           | toll free: 1-800-818-341         |
| <b>Austria</b> *<br>(Vienna)                                                                                                           | Switchboard . . . . .                                                 |           | 491 04 0                         |
|                                                                                                                                        | Technical Support . . . . .                                           |           | 0660-8779                        |
| <b>Belgium</b> *<br>(Brussels)                                                                                                         | Customer Technical Support . . . . .                                  | 02        | 4819288                          |
|                                                                                                                                        | Sales . . . . .                                                       |           | toll free: 0800 16884            |
|                                                                                                                                        | SalesFax . . . . .                                                    | 02        | 4819299                          |
|                                                                                                                                        | Switchboard . . . . .                                                 | 02        | 4819100                          |
|                                                                                                                                        | Fax . . . . .                                                         | 02        | 4819299                          |
| <b>Brunei</b><br><br><i>NOTE: Customers<br/>in Brunei call Malay-<br/>sia for sales,<br/>customer, and tech-<br/>nical assistance.</i> | Customer Technical Support (Penang, Malaysia) . . . . .               |           | 810 4966                         |
|                                                                                                                                        | Customer Service (Penang, Malaysia) . . . . .                         |           | 810 4949                         |
|                                                                                                                                        | Transaction Sales (Penang, Malaysia) . . . . .                        |           | 810 4955                         |

\* For technical assistance in this country after normal working hours, use one of the following numbers:  
(353-1) 204 4008 or (353-1) 286 5908 (English only—the call is rerouted to the U.S.A.).

**Table 8-2. Dell Contact Numbers (continued)**

| Country (City)                                                                                                                   | Department Name or Service                                   | Area Code | Local Number or Toll-Free Number |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------|----------------------------------|
| <b>Canada</b><br>(North York, Ontario)<br><br><i>NOTE: Customers in Canada call the U.S.A. for access to TechConnect BBS.</i>    | Automated Order-Status System . . . . .                      |           | toll free: 1-800-433-9014        |
|                                                                                                                                  | AutoTech (Automated technical support) . . . . .             |           | toll free: 1-800-247-9362        |
|                                                                                                                                  | Customer Care (From outside Toronto) . . . . .               |           | toll free: 1-800-387-5759        |
|                                                                                                                                  | Customer Care (From within Toronto) . . . . .                | 416       | 758-2400                         |
|                                                                                                                                  | Customer Technical Support . . . . .                         |           | toll free: 1-800-847-4096        |
|                                                                                                                                  | Sales (Direct Sales—from outside Toronto) . . . . .          |           | toll free: 1-800-387-5752        |
|                                                                                                                                  | Sales (Direct Sales—from within Toronto) . . . . .           | 416       | 758-2200                         |
|                                                                                                                                  | Sales (Federal government, education, and medical) . . . . . |           | toll free: 1-800-567-7542        |
|                                                                                                                                  | Sales (Major Accounts) . . . . .                             |           | toll free: 1-800-387-5755        |
|                                                                                                                                  | TechConnect BBS (Austin, Texas, U.S.A.) . . . . .            | 512       | 728-8528                         |
| <b>Chile</b><br>(Santiago)<br><br><i>NOTE: Customers in Chile call the U.S.A. for sales, customer, and technical assistance.</i> | TechFax . . . . .                                            |           | toll free: 1-800-950-1329        |
|                                                                                                                                  | Sales, Customer Support, and Technical Support . . . . .     |           | toll free: 1230-020-4823         |
| <b>China</b><br>(Xiamen)                                                                                                         | Customer Technical Service . . . . .                         |           | toll free: 1-800-858-2437        |
|                                                                                                                                  | Sales . . . . .                                              |           | toll free: 1-800-858-2222        |
| <b>Czech Republic*</b><br>(Prague)                                                                                               | Technical Support . . . . .                                  | 02        | 22 83 27 27                      |
|                                                                                                                                  | Fax . . . . .                                                | 02        | 22 83 27 14                      |
|                                                                                                                                  | TechFax . . . . .                                            | 02        | 22 83 27 28                      |
|                                                                                                                                  | Switchboard . . . . .                                        | 02        | 22 83 27 11                      |
| <b>Denmark*</b><br>(Horsholm)                                                                                                    | Customer Care, Technical Support, and Sales . . . . .        |           | toll free: 800 171 62            |
| <b>Finland*</b><br>(Helsinki)                                                                                                    | Technical Support . . . . .                                  | 09        | 253 313 60                       |
|                                                                                                                                  | Customer Service . . . . .                                   | 09        | 253 313 61                       |
|                                                                                                                                  | Fax . . . . .                                                | 09        | 253 313 99                       |
|                                                                                                                                  | Switchboard . . . . .                                        | 09        | 253 313 00                       |

\* For technical assistance in this country after normal working hours, use one of the following numbers: (353-1) 204 4008 or (353-1) 286 5908 (English only—the call is rerouted to the U.S.A.).



**Table 8-2. Dell Contact Numbers (continued)**

| Country (City)                                                                                     | Department Name or Service                       | Area Code       | Local Number or Toll-Free Number |
|----------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------|----------------------------------|
| <b>France*</b><br>(Paris/Montpellier)                                                              | Technical Support (Paris) . . . . .              | 01 . . . . .    | 47 62 68 90                      |
|                                                                                                    | Technical Support (Montpellier) . . . . .        | 04 . . . . .    | 67 06 62 86                      |
|                                                                                                    | Customer Care (Major Accounts) (Paris) . . . . . | 01 . . . . .    | 47 62 69 39                      |
|                                                                                                    | Customer Care (VAR Accounts) (Paris) . . . . .   | 01 . . . . .    | 47 62 69 26                      |
|                                                                                                    | Customer Care (Direct Sales) (Paris) . . . . .   | 01 . . . . .    | 47 62 69 76                      |
|                                                                                                    | TechFax (Montpellier) . . . . .                  | 04 . . . . .    | 67 22 53 11                      |
|                                                                                                    | TechConnect BBS (Montpellier) . . . . .          | 04 . . . . .    | 67 22 53 04                      |
|                                                                                                    | Switchboard (Paris) . . . . .                    | 01 . . . . .    | 47 62 68 50                      |
|                                                                                                    | Switchboard (Montpellier) . . . . .              | 04 . . . . .    | 67 06 65 51                      |
| <b>Germany*</b><br>(Langen)                                                                        | Customer Technical Support . . . . .             | 06103 . . . . . | .971-200                         |
|                                                                                                    | Customer Care . . . . .                          | 06103 . . . . . | .971-500                         |
|                                                                                                    | TechConnect BBS . . . . .                        | 06103 . . . . . | .971-666                         |
|                                                                                                    | Sales . . . . .                                  | 06103 . . . . . | .971-460                         |
| <b>Hong Kong</b><br><br><i>NOTE: Customers in Hong Kong call Malaysia for customer assistance.</i> | Technical Support . . . . .                      |                 | toll free: 800 96 4107           |
|                                                                                                    | Customer Service (Penang, Malaysia) . . . . .    |                 | .810 4949                        |
|                                                                                                    | Transaction Sales . . . . .                      |                 | toll free: 800 96 4109           |
|                                                                                                    | Corporate Sales . . . . .                        |                 | toll free: 800 96 4108           |
| <b>Ireland*</b><br>(Bray)                                                                          | Customer Technical Support . . . . .             |                 | 1-850-543-543                    |
|                                                                                                    | Sales . . . . .                                  |                 | 1-850-235-235                    |
|                                                                                                    | SalesFax . . . . .                               | 01 . . . . .    | 286 2020                         |
|                                                                                                    | Fax . . . . .                                    | 01 . . . . .    | 286 6848                         |
|                                                                                                    | TechConnect BBS . . . . .                        | 01 . . . . .    | .204 4711                        |
|                                                                                                    | TechFax . . . . .                                | 01 . . . . .    | 204 4708                         |
|                                                                                                    | Switchboard . . . . .                            | 01 . . . . .    | 286 0500                         |
| <b>Italy*</b><br>(Milan)                                                                           | Switchboard . . . . .                            |                 | 577821                           |
|                                                                                                    | Fax . . . . .                                    |                 | 57503530                         |

\* For technical assistance in this country after normal working hours, use one of the following numbers:  
(353-1) 204 4008 or (353-1) 286 5908 (English only—the call is rerouted to the U.S.A.).

**Table 8-2. Dell Contact Numbers (continued)**

| Country (City)                                                                                                                                                                                                                             | Department Name or Service                                                     | Area Code | Local Number or Toll-Free Number |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|-----------|----------------------------------|
| <b>Japan</b><br>(Kawasaki)                                                                                                                                                                                                                 | Technical Support. . . . .                                                     |           | toll free: 0088-22-7890          |
|                                                                                                                                                                                                                                            | Customer Care. . . . .                                                         | 044       | 556-4240                         |
|                                                                                                                                                                                                                                            | Direct Sales . . . . .                                                         | 044       | 556-3344                         |
|                                                                                                                                                                                                                                            | Commercial Sales . . . . .                                                     | 044       | 556-3430                         |
|                                                                                                                                                                                                                                            | Switchboard. . . . .                                                           | 044       | 556-3440<br>556-4300             |
| <b>Korea</b><br>(Seoul)<br><br><i>NOTE: Customers in Korea call Malaysia for customer assistance.</i>                                                                                                                                      | Technical Support. . . . .                                                     |           | toll free: 080-200-3800          |
|                                                                                                                                                                                                                                            | Transaction Sales . . . . .                                                    |           | toll free: 080-200-3600          |
|                                                                                                                                                                                                                                            | Corporate Sales . . . . .                                                      |           | toll free: 080-200-3900          |
|                                                                                                                                                                                                                                            | Customer Service (Penang, Malaysia) . . . . .                                  |           | 810 4949                         |
|                                                                                                                                                                                                                                            | Fax . . . . .                                                                  |           | 394 3122                         |
|                                                                                                                                                                                                                                            | Switchboard . . . . .                                                          |           | 287 5600                         |
| <b>Latin America</b><br><br><i>NOTE: Customers in Latin America call the U.S.A. for sales, customer, and technical assistance.</i>                                                                                                         | Customer Technical Support (Austin, Texas, U.S.A.) . . . . .                   | 512       | 728-4093                         |
|                                                                                                                                                                                                                                            | Customer Service (Austin, Texas, U.S.A.) . . . . .                             | 512       | 728-3619                         |
|                                                                                                                                                                                                                                            | Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.) . . . . . | 512       | 728-3883                         |
|                                                                                                                                                                                                                                            | Sales (Austin, Texas, U.S.A.) . . . . .                                        | 512       | 728-4397                         |
|                                                                                                                                                                                                                                            | SalesFax (Austin, Texas, U.S.A.) . . . . .                                     | 512       | 728-4600                         |
|                                                                                                                                                                                                                                            |                                                                                |           | 728-3772                         |
| <b>Luxembourg*</b><br><br><i>NOTE: Customers in Luxembourg may call Belgium for sales, customer, and technical assistance as well as the SalesFax service, and they call the Netherlands for the TechFax and TechConnect BBS services.</i> | Customer Technical Support (Brussels, Belgium) . . . . .                       |           | toll free: 0800 2109             |
|                                                                                                                                                                                                                                            | Customer Service (Luxembourg) . . . . .                                        |           | 295151                           |
|                                                                                                                                                                                                                                            | Customer Service (Brussels, Belgium) . . . . .                                 | 02        | 481 92 99                        |
|                                                                                                                                                                                                                                            | SalesFax (Brussels, Belgium) . . . . .                                         | 02        | 481 92 44                        |
|                                                                                                                                                                                                                                            | TechFax (Amsterdam, Netherlands) . . . . .                                     |           | 682 91 06                        |
|                                                                                                                                                                                                                                            | TechConnect BBS (Amsterdam, Netherlands) . . . . .                             |           | 686 65 04                        |

\* For technical assistance in this country after normal working hours, use one of the following numbers: (353-1) 204 4008 or (353-1) 286 5908 (English only—the call is rerouted to the U.S.A.).

**Table 8-2. Dell Contact Numbers (continued)**

| Country (City)                                                                                                                                           | Department Name or Service                                                        | Area Code | Local Number or Toll-Free Number |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------|----------------------------------|
| <b>Macau</b><br><br><i>NOTE: Customers in Macau call Malaysia for customer assistance.</i>                                                               | Technical Support . . . . .                                                       |           | toll free: 0800 582              |
|                                                                                                                                                          | Customer Service (Penang, Malaysia) . . . . .                                     |           | .810 4949                        |
|                                                                                                                                                          | Transaction Sales . . . . .                                                       |           | toll free: 0800 581              |
| <b>Malaysia</b><br>(Penang)                                                                                                                              | Technical Support . . . . .                                                       |           | toll free: 1 800 888 298         |
|                                                                                                                                                          | Customer Service . . . . .                                                        | 04.       | .810 4949                        |
|                                                                                                                                                          | Transaction Sales . . . . .                                                       |           | toll free: 1 800 888 202         |
|                                                                                                                                                          | Corporate Sales . . . . .                                                         |           | toll free: 1 800 888 213         |
| <b>Mexico</b><br>(Colonia Granada)<br><br><i>NOTE: Customers in Mexico call the U.S.A. for access to the Automated Order-Status System and AutoTech.</i> | Automated Order-Status System (Austin, Texas, U.S.A.) . . . . .                   | 512.      | 728-0685                         |
|                                                                                                                                                          | AutoTech (Automated technical support) (Austin, Texas, U.S.A.) . . . . .          | 512.      | 728-0686                         |
|                                                                                                                                                          | Customer Technical Support . . . . .                                              | 525.      | 228-7870                         |
|                                                                                                                                                          | Sales. . . . .                                                                    | 525.      | 228-7811                         |
|                                                                                                                                                          |                                                                                   |           | toll free: 91-800-900-37         |
|                                                                                                                                                          |                                                                                   |           | toll free: 91-800-904-49         |
|                                                                                                                                                          | Customer Service . . . . .                                                        | 525.      | 228-7878                         |
|                                                                                                                                                          | Main . . . . .                                                                    | 525.      | 228-7800                         |
| <b>Netherlands*</b><br>(Amsterdam)                                                                                                                       | Customer Technical Support . . . . .                                              | 020.      | 5818838                          |
|                                                                                                                                                          | Direct Sales . . . . .                                                            |           | toll free: 0800-0663             |
|                                                                                                                                                          | Direct SalesFax . . . . .                                                         | 020.      | 682 7171                         |
|                                                                                                                                                          | Corporate Sales . . . . .                                                         | 020.      | 581 8818                         |
|                                                                                                                                                          | Corporate SalesFax . . . . .                                                      | 020.      | 686 8003                         |
|                                                                                                                                                          | TechConnect BBS. . . . .                                                          | 020.      | 686 6504                         |
| <b>New Zealand</b>                                                                                                                                       | Technical Support (Dell Dimension systems only) (\$2.50 + GST per call) . . . . . |           | .0900 51010                      |
|                                                                                                                                                          | Technical Support (Other systems) . . . . .                                       |           | 0800 446 255                     |
|                                                                                                                                                          | Customer Service . . . . .                                                        |           | 0800 444 617                     |
|                                                                                                                                                          | Sales. . . . .                                                                    |           | 0800 441 567                     |
|                                                                                                                                                          | Fax . . . . .                                                                     |           | 0800 441 566                     |

\* For technical assistance in this country after normal working hours, use one of the following numbers: (353-1) 204 4008 or (353-1) 286 5908 (English only—the call is rerouted to the U.S.A.).



**Table 8-2. Dell Contact Numbers (continued)**

| Country (City)                                                                                                                                                                                                                 | Department Name or Service                                                           | Area Code | Local Number or Toll-Free Number |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|-----------|----------------------------------|
| <b>Poland *</b><br>(Warsaw)                                                                                                                                                                                                    | Switchboard . . . . .                                                                |           | 60 61 999                        |
|                                                                                                                                                                                                                                | Fax . . . . .                                                                        |           | 60 61 998                        |
| <b>Norway *</b><br>(Lysaker)                                                                                                                                                                                                   | Customer Technical Support and Customer Service . . . . .                            |           | 22-67 50 00                      |
|                                                                                                                                                                                                                                | Sales . . . . .                                                                      |           | 67-125 711                       |
| <b>Singapore</b><br>(Singapore)<br><br><i>NOTE: Customers in Singapore call Malaysia for customer assistance.</i>                                                                                                              | Technical Support . . . . .                                                          |           | toll free: 800 6011 051          |
|                                                                                                                                                                                                                                | Customer Service (Penang, Malaysia) . . . . .                                        | 04        | 810 4949                         |
|                                                                                                                                                                                                                                | Transaction Sales . . . . .                                                          |           | toll free: 800 6011 054          |
|                                                                                                                                                                                                                                | Corporate Sales . . . . .                                                            |           | toll free: 800 6011 053          |
| <b>South Africa</b><br>(Johannesburg)                                                                                                                                                                                          | Switchboard . . . . .                                                                | 011       | 709 7700                         |
|                                                                                                                                                                                                                                | Technical Support . . . . .                                                          | 011       | 709 7710                         |
|                                                                                                                                                                                                                                | Fax . . . . .                                                                        | 011       | 706 0495                         |
| <b>Southeast Asian/<br/>Pacific Countries</b><br>(excluding Australia, Brunei, China, Hong Kong, Japan, Korea, Macau, Malaysia, New Zealand, Singapore, Taiwan, and Thailand—refer to individual listings for these countries) | Customer Technical Support, Customer Service, and Sales (Penang, Malaysia) . . . . . |           | 60 4 810-4810                    |
| <b>Spain *</b><br>(Madrid)                                                                                                                                                                                                     | Technical Support . . . . .                                                          | 91        | 902 100 130                      |
|                                                                                                                                                                                                                                | Customer Service . . . . .                                                           | 91        | 329 10 80                        |
|                                                                                                                                                                                                                                | TechConnect BBS . . . . .                                                            | 91        | 329 33 53                        |
|                                                                                                                                                                                                                                | Sales . . . . .                                                                      | 91        | 902 100 185                      |
|                                                                                                                                                                                                                                | Switchboard . . . . .                                                                | 91        | 722 92 00                        |
| <b>Sweden *</b><br>(Upplands Vasby)                                                                                                                                                                                            | Technical Support . . . . .                                                          | 08        | 590 05 199                       |
|                                                                                                                                                                                                                                | Customer Care . . . . .                                                              | 08        | 590 05 169                       |
|                                                                                                                                                                                                                                | TechConnect BBS . . . . .                                                            | 08        | 590 05 591                       |
|                                                                                                                                                                                                                                | Sales . . . . .                                                                      | 08        | 590 05 185                       |

\* For technical assistance in this country after normal working hours, use one of the following numbers: (353-1) 204 4008 or (353-1) 286 5908 (English only—the call is rerouted to the U.S.A.).

**Table 8-2. Dell Contact Numbers** (continued)

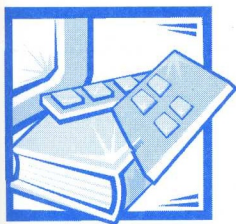
| Country (City)                                                                                   | Department Name or Service                                       | Area Code                           | Local Number or Toll-Free Number |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------|----------------------------------|
| <b>Switzerland*</b><br>(Geneva)                                                                  | Technical Support . . . . .                                      |                                     | 0844 811 411                     |
|                                                                                                  | Commercial Services . . . . .                                    | 022 . . . . .                       | 799 01 01                        |
|                                                                                                  | Customer Service . . . . .                                       | 022 . . . . .                       | 799 01 50                        |
|                                                                                                  | Fax . . . . .                                                    | 022 . . . . .                       | 799 01 90                        |
| <b>Taiwan</b><br><br><i>NOTE: Customers in Taiwan call Malaysia for customer assistance.</i>     | Technical Support . . . . .                                      | toll free: 0080 651 226/0800 33 557 |                                  |
|                                                                                                  | Customer Service (Penang, Malaysia) . . . . .                    |                                     | 810 4949                         |
|                                                                                                  | Transaction Sales . . . . .                                      | toll free: 0080 651 228/0800 33 556 |                                  |
|                                                                                                  | Corporate Sales . . . . .                                        | toll free: 0080 651 227/0800 33 555 |                                  |
| <b>Thailand</b><br><br><i>NOTE: Customers in Thailand call Malaysia for customer assistance.</i> | Technical Support . . . . .                                      | toll free: 0880 060 07              |                                  |
|                                                                                                  | Customer Service (Penang, Malaysia) . . . . .                    |                                     | 810 4949                         |
|                                                                                                  | Sales . . . . .                                                  | toll free: 0880 060 06              |                                  |
| <b>U.K.*</b><br>(Bracknell)                                                                      | Customer Technical Support<br>(Dell Dimension systems) . . . . . | 01344 . . . . .                     | 720111                           |
|                                                                                                  | Customer Care . . . . .                                          | 01344 . . . . .                     | 720110                           |
|                                                                                                  | TechFax . . . . .                                                | 01344 . . . . .                     | 723178                           |
|                                                                                                  | TechConnect BBS . . . . .                                        | 01344 . . . . .                     | 723858                           |
|                                                                                                  | Sales . . . . .                                                  | 01344 . . . . .                     | 720000                           |

\* For technical assistance in this country after normal working hours, use one of the following numbers:  
(353-1) 204 4008 or (353-1) 286 5908 (English only—the call is rerouted to the U.S.A.).

**Table 8-2. Dell Contact Numbers** (continued)

| Country (City)            | Department Name or Service                                                                                                                                                  | Area Code | Local Number or Toll-Free Number |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------|
| U.S.A.<br>(Austin, Texas) | Automated Order-Status System . . . . .                                                                                                                                     |           | toll free: 1-800-433-9014        |
|                           | AutoTech (Automated technical support) . . . . .                                                                                                                            |           | toll free: 1-800-247-9362        |
|                           | <b>Dell Home and Small Business Group:</b>                                                                                                                                  |           |                                  |
|                           | Customer Technical Support<br>(Return Material Authorization Numbers) . . . . .                                                                                             |           | toll free: 1-800-624-9896        |
|                           | Customer Service<br>(Credit Return Authorization Numbers) . . . . .                                                                                                         |           | toll free: 1-800-624-9897        |
|                           | <b>National Accounts</b> (systems purchased by established Dell national accounts [have your account number handy], medical institutions, or value-added resellers [VARs]): |           |                                  |
|                           | Customer Service and Technical Support<br>(Return Material Authorization Numbers) . . . . .                                                                                 |           | toll free: 1-800-822-8965        |
|                           | <b>Public Americas International</b> (systems purchased by governmental agencies [local, state, or federal] or educational institutions):                                   |           |                                  |
|                           | Customer Service and Technical Support<br>(Return Material Authorization Numbers) . . . . .                                                                                 |           | toll free: 1-800-234-1490        |
|                           | Dell Sales . . . . .                                                                                                                                                        |           | toll free: 1-800-247-4618        |
|                           | Spare Parts Sales . . . . .                                                                                                                                                 |           | toll free: 1-800-357-3355        |
|                           | DellWare . . . . .                                                                                                                                                          |           | toll free: 1-800-753-7201        |
|                           | DellWare FaxBack Service . . . . .                                                                                                                                          | 512       | 728-1681                         |
|                           | Fee-Based Technical Support . . . . .                                                                                                                                       |           | toll free: 1-800-433-9005        |
|                           | Sales (Catalogs) . . . . .                                                                                                                                                  |           | toll free: 1-800-426-5150        |
|                           | Fax . . . . .                                                                                                                                                               |           | toll free: 1-800-727-8320        |
|                           | TechFax . . . . .                                                                                                                                                           |           | toll free: 1-800-950-1329        |
|                           | TechConnect BBS . . . . .                                                                                                                                                   | 512       | 728-8528                         |
|                           | Switchboard . . . . .                                                                                                                                                       | 512       | 338-4400                         |





# APPENDIX A

## System Specifications

**Table A-1. Technical Specifications**

| Microprocessor                |                                                                                                                                                                                                                                                      |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Microprocessor type . . . . . | Intel Pentium II microprocessor that runs at 350 MHz internally/100 MHz externally, at 400 MHz internally/100 MHz externally, or at 450 MHz internally/100 MHz externally. A slower compatibility speed can be set through the system setup program. |
| L1 cache . . . . .            | 32-KB (16-KB data cache; 16-KB instruction cache)                                                                                                                                                                                                    |
| L2 cache . . . . .            | 512-KB pipelined write-back SRAM on the SEC                                                                                                                                                                                                          |
| Math coprocessor . . . . .    | internal to microprocessor                                                                                                                                                                                                                           |
| System Information            |                                                                                                                                                                                                                                                      |
| System chip set . . . . .     | Intel 440BX AGPset                                                                                                                                                                                                                                   |
| Data bus width . . . . .      | 64 bits                                                                                                                                                                                                                                              |
| Address bus width . . . . .   | 32 bits                                                                                                                                                                                                                                              |
| DMA channels . . . . .        | seven                                                                                                                                                                                                                                                |
| Interrupt levels . . . . .    | 15                                                                                                                                                                                                                                                   |
| System BIOS chip . . . . .    | 2 Mb (256 KB)                                                                                                                                                                                                                                        |
| Expansion Bus                 |                                                                                                                                                                                                                                                      |
| Bus types . . . . .           | PCI (version 2.1), ISA, and AGP                                                                                                                                                                                                                      |
| Bus speed . . . . .           | AGP: 66 or 133 MHz (based on video card)<br>PCI: 33 MHz<br>ISA: 8.33 MHz                                                                                                                                                                             |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

**Table A-1. Technical Specifications** (continued)

| <b>Expansion Bus</b> (continued)                            |                                                             |
|-------------------------------------------------------------|-------------------------------------------------------------|
| AGP expansion-card connectors . . . . .                     | one                                                         |
| AGP expansion-card connector size . . . . .                 | 120 pins                                                    |
| AGP expansion-card connector data width (maximum) . . . . . | 32 bits                                                     |
| PCI expansion-card connectors . . . . .                     | four (one shares a card-slot opening with an ISA connector) |
| PCI expansion-card connector size . . . . .                 | 120 pins                                                    |
| PCI expansion-card connector data width (maximum) . . . . . | 32 bits                                                     |
| ISA expansion-card connectors . . . . .                     | two (one shares a card-slot opening with a PCI connector)   |
| ISA expansion-card connector size . . . . .                 | 98 pins                                                     |
| ISA expansion-card connector data width (maximum) . . . . . | 16 bits                                                     |
| <b>System Clock</b>                                         |                                                             |
| System clock . . . . .                                      | 100 MHz (matches external processor speed)                  |
| Diskette/communications ports . . . . .                     | 48 MHz from the system clock                                |
| <b>Memory</b>                                               |                                                             |
| Architecture . . . . .                                      | ECC or non-ECC SDRAM modules                                |
| DIMM sockets . . . . .                                      | three; gold contacts                                        |
| DIMM capacities . . . . .                                   | 32, 64, and 128 MB                                          |
| Standard RAM . . . . .                                      | 64 MB (non-ECC)                                             |
| Maximum RAM . . . . .                                       | 384 MB                                                      |
| Frequency . . . . .                                         | 100 MHz                                                     |
| Clock cycle . . . . .                                       | 10 ns (supports 4 clocks only)                              |
| CAS latency . . . . .                                       | 3                                                           |
| SPD revision . . . . .                                      | 1.2                                                         |
| Buffering . . . . .                                         | unbuffered                                                  |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

**Table A-1. Technical Specifications** (continued)

| <b>Memory</b> (continued)    |                                                             |
|------------------------------|-------------------------------------------------------------|
| Voltage.....                 | 3.3 V                                                       |
| Data bus width .....         | 8 bits                                                      |
| BIOS address.....            | F0000h                                                      |
| <b>Drives</b>                |                                                             |
| Externally accessible:       |                                                             |
| Mini tower chassis .....     | two 5.25-inch bays<br>three 3.5-inch bays                   |
| Desktop chassis .....        | two 5.25-inch bays<br>two 3.5-inch bays                     |
| Internally accessible .....  | two bays for 1-inch-high EIDE or SCSI hard-disk drives      |
| <b>Ports and Connectors</b>  |                                                             |
| Externally accessible:       |                                                             |
| Serial (DTE).....            | one 9-pin connector; 16550C-compatible                      |
| Parallel .....               | one 25-hole connector (bidirectional)                       |
| Video .....                  | one 15-hole connector on an AGP video card                  |
| Audio <sup>1</sup> .....     | three miniature jacks for line in, line out, and microphone |
| PS/2-style keyboard .....    | 6-pin mini-DIN connector                                    |
| PS/2-compatible mouse .....  | 6-pin mini-DIN connector                                    |
| MIDI/game <sup>1</sup> ..... | one 15-pin connector                                        |
| USB .....                    | two USB-compliant connectors                                |
| Internally accessible:       |                                                             |
| Primary EIDE channel.....    | 40-pin connector on PCI local bus                           |
| Secondary EIDE channel ..... | 40-pin connector on PCI local bus                           |
| Diskette drive .....         | 34-pin connector                                            |
| <b>Video</b>                 |                                                             |
| Video type .....             | AGP video card (see manufacturer's specifications)          |

<sup>1</sup> Available in on-board audio systems only.

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.



**Table A-1. Technical Specifications** (continued)

| <b>Controls and Indicators</b>             |                                                |
|--------------------------------------------|------------------------------------------------|
| Reset control . . . . .                    | push button                                    |
| Power control . . . . .                    | push button                                    |
| Power indicator . . . . .                  | green LED                                      |
| Hard-disk drive access indicator . . . . . | green LED                                      |
| <b>Power</b>                               |                                                |
| DC power supply:                           |                                                |
| Wattage . . . . .                          | 200 W                                          |
| Heat dissipation . . . . .                 | 778 BTU (fully loaded system without monitor)  |
| Voltage . . . . .                          | 90 to 135 V at 60 Hz;<br>180 to 265 V at 50 Hz |
| Backup battery . . . . .                   | 3-V CR2032 coin cell                           |
| <b>Physical</b>                            |                                                |
| Mini tower chassis:                        |                                                |
| Height . . . . .                           | 43.69 cm (17.2 inches)                         |
| Width . . . . .                            | 20.32 cm (8 inches)                            |
| Depth . . . . .                            | 44.45 cm (17.5 inches)                         |
| Weight . . . . .                           | 11.3 to 13.6 kg (25.0 to 30.0 lb)              |
| Desktop chassis:                           |                                                |
| Height . . . . .                           | 16.00 cm (6.3 inches)                          |
| Width . . . . .                            | 42.42 cm (16.7 inches)                         |
| Depth . . . . .                            | 44.45 cm (17.5 inches)                         |
| Weight . . . . .                           | 11.3 to 13.6 kg (25.0 to 30.0 lb)              |

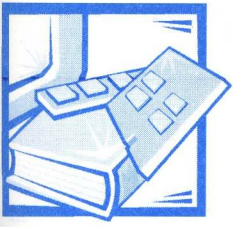
NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

**Table A-1. Technical Specifications** (continued)

| Environmental               |                                                                                                                            |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Temperature:                |                                                                                                                            |
| Operating . . . . .         | 10° to 35°C <sup>2</sup> (50° to 95°F)                                                                                     |
| Storage . . . . .           | –40° to 65°C (–40° to 149°F)                                                                                               |
| Relative humidity . . . . . | 20% to 80% (noncondensing)                                                                                                 |
| Maximum vibration:          |                                                                                                                            |
| Operating . . . . .         | 0.25 G at 3 to 200 Hz at 1/2 octave/min                                                                                    |
| Storage . . . . .           | 0.5 G at 3 to 200 Hz at 1/2 octave/min                                                                                     |
| Maximum shock:              |                                                                                                                            |
| Operating . . . . .         | left side (for mini tower orientation) and bottom half-sine pulse with a change in velocity of 50.8 cm/sec (20 inches/sec) |
| Storage . . . . .           | 23-G faired-square wave with a velocity change of 508 cm/sec (200 inches/sec)                                              |
| Altitude:                   |                                                                                                                            |
| Operating . . . . .         | –16 to 3048 m <sup>2</sup> (–50 to 10,000 ft)                                                                              |
| Storage . . . . .           | –16 to 10,600 m (–50 to 35,000 ft)                                                                                         |

<sup>2</sup> At 35°C (95°F), the maximum operating altitude is 914 m (3000 ft).

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.



## APPENDIX B

# System Setup Program

This appendix describes the system setup program, which you can use to configure your computer system as well as enable and disable your system's password features.

Each time you turn on your computer system or press the reset button, the system compares the hardware installed in the system to the hardware listed in the configuration information stored in nonvolatile random-access memory (NVRAM) on the system board. If the system detects a discrepancy between the two, it generates error messages that identify the incorrect configuration settings. The system then prompts you to enter the system setup program to correct the setting.

You can use the system setup program as follows:

- To change the system configuration information after you add, change, or remove any hardware in your system
- To set or change user-selectable options—for example, the user password

Dell recommends that you print the system setup program screens (by pressing <Print Screen>) or write down the information for future reference.

Before you use the system setup program, you need to know the kind of hard-disk drive(s) and diskette drive(s) installed in your computer. If you are unsure of any of this information, refer to the online **Manufacturing Test Report** in the **Dell Accessories** folder.

## Entering the System Setup Program

Enter the system setup program as follows:

1. Turn on (or reboot) your system.
2. When prompted with the message `Press <DEL> to enter SETUP`, press <Del> *immediately*.

If you wait too long and the operating system begins to load into memory, *let the system complete the load operation*. Then shut down the system and try again.

You can also enter the system setup program by responding to certain error messages.



## Using the System Setup Program

Table B-1 lists the keys you use to view or change information on the system setup screens and to exit the program.

**Table B-1. System Setup Navigation Keys**

| Keys                                                                                                                                                                    | Action                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                        | Displays help information.                                                                                                                                                                                                   |
|                                                                                        | Returns to the parent menu; from a parent menu, exits without saving changes.                                                                                                                                                |
|  or   | Moves the cursor up or down to select an item.                                                                                                                                                                               |
|  or   | Moves the cursor to the previous or next menu option.                                                                                                                                                                        |
|  or   | Increases or decreases the current value in the selected field or cycles through settings for the selected option.                                                                                                           |
|                                                                                       | Selects the submenu for the current option (if there is one) or, on the <b>Exit</b> menu, performs the current command. For <b>System Time</b> and <b>System Date</b> , pressing <Enter> moves the cursor to the next field. |
|                                                                                      | Reverts all settings to the initial defaults.                                                                                                                                                                                |
|                                                                                      | Saves changes and exits the program.                                                                                                                                                                                         |
|  or                                                                                  | For <b>System Time</b> and <b>System Date</b> , moves the cursor to the next or previous field.                                                                                                                              |
|   |                                                                                                                                                                                                                              |

# System Setup Screens and Options

The system setup screens are organized as follows:

- At the top is a menu bar for accessing the main program screens.
- The box on the left side of each screen lists options that define the installed hardware in your system.

Fields beside the options contain settings or values. You can change those that are enclosed in brackets. Values that are not enclosed in brackets contain status information reported by the system.

- The box on the right side of each screen displays help information for the option with a currently highlighted field.
- The bottom area lists keys and their functions for the currently displayed screen.

The menu bar provides access to the following six screens:

- **Main** screen — Provides settings for the basic system configuration
- **Advanced** screen — Provides detailed settings for some system features
- **Security** screen — Provides indications and settings for system password and setup password
- **Power** screen — Provides settings for the system power-management features
- **Boot** screen — Provides information about which device boots the system
- **Exit** screen — Provides selections for saving and loading the configurations and options

In addition to these screens, options identified by a right arrow (see Figure B-1 for an example) provide access to submenus.

## Main Screen

## Dell Dimension XPS R400 Setup

| Main    Advanced    Security    Power    Boot    Exit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |                           |                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------|----------------------|
| BIOS Version                      4S4EB0X1.10A.0000.D [A00]<br>Processor Type                    Pentium [R] II processor<br>Processor Speed                   400 MHz<br>Cache RAM                        512 KB<br>Service Tag                       M5JNS<br><br>System Memory                   64 MB<br>Memory Bank 0                   64 MB SDRAM<br>Memory Bank 1                   Not Installed<br>Memory Bank 2                   Not Installed<br><br>Language:                        [ English [US] ]<br>ECC Configuration                [ ECC ]<br>L2 Cache ECC Support:           [ Enabled ]<br><br>System Time:                      [ 09:28:04 ]<br>System Date:                      [ 04/09/1998 ] |                |                           | Item Specific Help   |
| F1    Help                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ↑↓ Select Item | -/+    Change Values      | F9    Setup Defaults |
| ESC   Exit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ↔ Select Menu  | Enter    Select ► Submenu | F10   Save and Exit  |

**Figure B-1. Main Screen Menu**

### Table B-2. Main Screen Menu Options

| Option                      | Function                                                                                                                                                                                                 |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BIOS Version</b>         | Displays the version of the BIOS being used.                                                                                                                                                             |
| <b>Processor Type</b>       | Displays the type of microprocessor installed.                                                                                                                                                           |
| <b>Processor Speed</b>      | Displays the internal speed of the microprocessor.                                                                                                                                                       |
| <b>Cache RAM</b>            | Indicates the amount of L2 cache memory installed.                                                                                                                                                       |
| <b>Service Tag</b>          | Displays the system's service tag.                                                                                                                                                                       |
| <b>System Memory</b>        | Displays the amount of system memory installed, ranging from 64 to 384 MB, in the three DIMM sockets on the system board.                                                                                |
| <b>Memory Bank <i>n</i></b> | Displays the size and type of memory in the DIMM sockets.                                                                                                                                                |
| <b>Language</b>             | Indicates the language in which the system setup program is displayed.                                                                                                                                   |
| <b>ECC Configuration</b>    | Appears on the screen only if the system detects an all-ECC memory configuration. Leave this option set to <b>ECC</b> (default) for optimum performance. To disable <b>ECC</b> , select <b>Non-ECC</b> . |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*



**Table B-2. Main Screen Menu Options** (continued)

| Option                      | Function                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>L2 Cache ECC Support</b> | When <b>Enabled</b> (default), this option allows error checking to occur on data accessed from the L2 cache. If set to <b>Disabled</b> , error checking is not performed.<br><br><b>CAUTION: Be sure that Enabled is selected before running mathematical application programs. Otherwise, error checking will not be performed on the cache data.</b> |
| <b>System Time</b>          | Resets the time on the system's internal clock.                                                                                                                                                                                                                                                                                                         |
| <b>System Date</b>          | Resets the date on the system's internal calendar.                                                                                                                                                                                                                                                                                                      |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## Advanced Screen

| Dell Dimension R400 Setup                                                                                                                                                                                                                                                                                                                                                                                                       |                |                        |                   |      |                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------|-------------------|------|------------------------------------------------------------------------------------------------|
| Main                                                                                                                                                                                                                                                                                                                                                                                                                            | Advanced       | Security               | Power             | Boot | Exit                                                                                           |
| <p style="text-align: center;">Setup Warning</p> <p>Setting Items on this menu to incorrect values may cause your system to malfunction.</p> <p>Plug &amp; Play O/S: [ No ]</p> <p>Reset Configuration Data: [ No ]</p> <p>Numlock: [ Auto ]</p> <p>► Peripheral Configuration</p> <p>► IDE Configuration</p> <p>► Diskette Options</p> <p>► DMI Event Logging</p> <p>► Video Configuration</p> <p>► Resource Configuration</p> |                |                        |                   |      | <p style="text-align: center;">Item Specific Help</p> <p style="text-align: center;">Reset</p> |
| F1 Help                                                                                                                                                                                                                                                                                                                                                                                                                         | ↑↓ Select Item | -/+ Change Values      | F9 Setup Defaults |      |                                                                                                |
| ESC Exit                                                                                                                                                                                                                                                                                                                                                                                                                        | ↔ Select Menu  | Enter Select ► Submenu | F10 Save and Exit |      |                                                                                                |

**Figure B-2. Advanced Screen Menu**

**Table B-3. Advanced Screen Menu Options**

| <b>Option</b>                   | <b>Function</b>                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Plug &amp; Play O/S</b>      | Determines whether the system is configured to support Plug and Play devices from the operating system or from the system BIOS. Leave this option set to <b>No</b> so the BIOS handles all Plug and Play operation.<br><br><i>NOTE: Be sure this option is set to <b>No</b> before running Dell Diagnostics. Otherwise, some diagnostics may incorrectly fail.</i> |
| <b>Reset Configuration Data</b> | Permits resetting Plug and Play configuration data to default values. <b>Yes</b> resets the data; <b>No</b> (default) retains the current Plug and Play settings. If set to <b>Yes</b> , configuration data reverts to default values the next time the system boots. This option automatically reverts back to the <b>No</b> setting.                             |
| <b>Numlock</b>                  | Selects the power-on state for Num Lock. Options are <b>Auto</b> (default), <b>On</b> , and <b>Off</b> .                                                                                                                                                                                                                                                           |
| <b>Peripheral Configuration</b> | Displays the <b>Peripheral Configuration</b> submenu. Refer to "Peripheral Configuration Submenu" found next in this appendix.                                                                                                                                                                                                                                     |
| <b>IDE Configuration</b>        | Displays the <b>IDE Configuration</b> submenu. Refer to "IDE Configuration Submenu" found later in this appendix.                                                                                                                                                                                                                                                  |
| <b>Diskette Options</b>         | Displays the <b>Diskette Options</b> submenu. Refer to "Diskette Options Submenu" found later in this appendix.                                                                                                                                                                                                                                                    |
| <b>DMI Event Logging</b>        | Displays the <b>DMI Event Logging</b> submenu. Refer to "DMI Event Logging Submenu" found later in this appendix.                                                                                                                                                                                                                                                  |
| <b>Video Configuration</b>      | Displays the <b>Video Configuration</b> submenu. Refer to "Video Configuration Submenu" found later in this appendix.                                                                                                                                                                                                                                              |
| <b>Resource Configuration</b>   | Displays the <b>Resource Configuration</b> submenu for allocating IRQs and memory ranges. Refer to "Resource Configuration Submenu" found later in this appendix.                                                                                                                                                                                                  |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## Peripheral Configuration Submenu

| Dell Dimension XPS R400 Setup |                    |                        |                   |
|-------------------------------|--------------------|------------------------|-------------------|
| Advanced                      |                    |                        |                   |
| Peripheral Configuration      |                    | Item Specific Help     |                   |
| Serial port A:                | [ Auto ]           |                        |                   |
| Parallel port:                | [ Auto ]           |                        |                   |
| Mode:                         | [ Bi-directional ] |                        |                   |
| Audio:                        | [ Enabled ]        |                        |                   |
| F1 Help                       | ↑↓ Select Item     | ~/+ Change Values      | F9 Setup Defaults |
| ESC Exit                      | ↔ Select Menu      | Enter Select ► Submenu | F10 Save and Exit |

**Figure B-3. Peripheral Configuration Submenu**

**Table B-4. Peripheral Configuration Submenu Options**

| Option           | Function                                                                                                                                                                             |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Serial port A    | Configures the serial port. Set this option to <b>Auto</b> (default), <b>Enabled</b> , or <b>Disabled</b> . If set to <b>Enabled</b> , you can set the following additional options: |
| Base I/O Address | Available I/O addresses are <b>COM1</b> , <b>COM2</b> , <b>COM3</b> , and <b>COM4</b> .                                                                                              |
| Interrupt        | Available interrupts are <b>IRQ3</b> and <b>IRQ4</b> .                                                                                                                               |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.



**Table B-4. Peripheral Configuration Submenu Options** (continued)

| Option                  | Function                                                                                                                                                                                                                                                                                                                               |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Parallel port</b>    | Configures the parallel port. Set this option to <b>Auto</b> (default), <b>Enabled</b> , or <b>Disabled</b> . Depending on the port setting, you can set the following additional options:                                                                                                                                             |
| <b>Mode</b>             | If port is set to <b>Auto</b> or <b>Enabled</b> , available modes are <b>Output Only</b> , <b>Bi-Directional</b> , <b>ECP</b> , and <b>EPP</b> .<br><br><i>NOTE: Refer to the device manufacturer's documentation for information on which mode to use before changing this setting.</i>                                               |
| <b>Base I/O Address</b> | If port is set to <b>Enabled</b> , available I/O addresses are <b>378h</b> (default), <b>278h</b> , <b>3BC</b> , and <b>228h</b> .                                                                                                                                                                                                     |
| <b>Interrupt</b>        | If port is set to <b>Enabled</b> , available interrupts are <b>IRQ7</b> and <b>IRQ5</b> .                                                                                                                                                                                                                                              |
| <b>Audio</b>            | <i>NOTE: This option is available in on-board audio systems only.</i><br><br>Determines if on-board audio controller is <b>Enabled</b> (default) or <b>Disabled</b> . Set this option to <b>Disabled</b> if you are using a sound card instead of the on-board audio controller or if the resources used by the controller are needed. |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## IDE Configuration Submenu

| Dell Dimension R400 Setup                                                                                                                                                  |      |                |       |                    |                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------|-------|--------------------|-------------------|
| Advanced                                                                                                                                                                   |      |                |       |                    |                   |
| IDE Configuration                                                                                                                                                          |      |                |       | Item Specific Help |                   |
| IDE controller [ Both ]<br>▶ Primary IDE Master [ IBM-DHEA-38451 ]<br>▶ Primary IDE Slave [ None ]<br>▶ Secondary IDE Master [ FX 120T ]<br>▶ Secondary IDE Slave [ None ] |      |                |       |                    |                   |
| F1                                                                                                                                                                         | Help | ↑↓ Select Item | —/+   | Change Values      | F9 Setup Defaults |
| ESC                                                                                                                                                                        | Exit | ↔ Select Menu  | Enter | Select ▶ Submenu   | F10 Save and Exit |

**Figure B-4. IDE Configuration Submenu**

**Table B-5. IDE Configuration Submenu Options**

| Option                    | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>IDE controller</b>     | Configures the integrated primary and secondary EIDE controllers and detects the types of drives attached to them. If set to <b>Primary</b> , <b>Secondary</b> , or <b>Both</b> , the designated controller(s) are enabled, and the types of drives attached are displayed. If set to either <b>Primary</b> or <b>Secondary</b> , the other controller is not enabled and the IRQ it normally uses becomes available. If set to <b>Disabled</b> , the system cannot detect any drives attached to the controllers and displays <b>None</b> for all four IDE drive options. |
| <b>Primary IDE Master</b> | Identifies the first drive attached to the primary EIDE interface, usually the boot hard-disk drive. Refer to "Primary IDE Master Submenu" found next in this appendix.                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Primary IDE Slave</b>  | Identifies the second drive attached to the primary EIDE interface, usually a second hard-disk drive. The format of this submenu is the same as the one described in "Primary IDE Master Submenu" found next in this appendix.                                                                                                                                                                                                                                                                                                                                             |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

**Table B-5. IDE Configuration Submenu Options** (continued)

| Option                      | Function                                                                                                                                                                                                                       |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Secondary IDE Master</b> | Identifies the first drive attached to the secondary EIDE interface, usually a CD-ROM or tape drive. The format of this submenu is the same as the one described in "Primary IDE Master Submenu" found next in this appendix.  |
| <b>Secondary IDE Slave</b>  | Identifies the second drive attached to the secondary EIDE interface, usually a CD-ROM or tape drive. The format of this submenu is the same as the one described in "Primary IDE Master Submenu" found next in this appendix. |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## Primary IDE Master Submenu

| Dell Dimension R400 Setup             |                |                        |                   |
|---------------------------------------|----------------|------------------------|-------------------|
| Advanced                              |                |                        |                   |
| Primary IDE Master [ IBM-DHEA-38451 ] |                | Item Specific Help     |                   |
| Type:                                 | [ Auto ]       |                        |                   |
| Maximum Capacity:                     | 8455 MB        |                        |                   |
| Multi-sector Transfers:               | [ 16 Sectors ] |                        |                   |
| LBA Mode Control:                     | [ Enabled ]    |                        |                   |
| Transfer Mode:                        | [ Fast PIO 4 ] |                        |                   |
| Ultra DMA:                            | [ Mode 2 ]     |                        |                   |
| F1 Help                               | ↑ Select Item  | -/+ Change Values      | F9 Setup Defaults |
| ESC Exit                              | ↔ Select Menu  | Enter Select ► Submenu | F10 Save and Exit |

**Figure B-5. Primary IDE Master Submenu**



**Table B-6. Primary IDE Master Submenu Options**

| Option                        | Function                                                                                                                                                                                                                                                                                                                                                                                                              |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Type</b>                   | Specifies the type of hard-disk drive. If the drive supports the auto-detect feature, set this option to <b>Auto</b> . <b>Cylinders</b> , <b>Heads</b> , and <b>Sectors</b> can be edited if <b>Type</b> is set to <b>User</b> . For a non-IDE drive, set <b>Type</b> to <b>None</b> .                                                                                                                                |
| <b>Maximum Capacity</b>       | Displays the drive's maximum storage capacity.                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Multi-sector Transfers</b> | Determines the number of sectors per block during multiple-sector transfers. If <b>Type</b> is set to <b>User</b> , set <b>Multi-sector Transfers</b> to <b>2 Sectors</b> , <b>4 Sectors</b> , <b>8 Sectors</b> , or <b>16 Sectors</b> or disable the feature.                                                                                                                                                        |
| <b>LBA Mode Control</b>       | Set to <b>Enable</b> (default) unless directed to change it by a Dell technical support representative.                                                                                                                                                                                                                                                                                                               |
| <b>Transfer Mode</b>          | Selects method of moving data to and from the EIDE drive. Options include <b>Standard</b> and the PIO modes 1, 2, 3, and 4, which can improve the performance of a hard-disk drive. (The higher the PIO number, the faster the transfer; most newer drives support <b>Fast PIO 4</b> .) For the optimum transfer mode, set <b>Type</b> to <b>Auto</b> . If <b>Type</b> is set to <b>Disabled</b> , PIO is turned off. |
| <b>Ultra DMA</b>              | Sets the Ultra DMA mode for the drive.                                                                                                                                                                                                                                                                                                                                                                                |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## Diskette Options Submenu

**Dell Dimension XPS R400 Setup**

**Advanced**

| Diskette Options                                                                                                                                | Item Specific Help |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Floppy disk controller: [ Enabled ]<br>Diskette A: [ 1.44/1.25 MB 3 1/2" ]<br>Diskette Write Protect: [ Disabled ]                              |                    |
| F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults<br>ESC Exit    ↔ Select Menu    Enter Select ► Submenu    F10 Save and Exit |                    |

**Figure B-6. Diskette Options Submenu**

**Table B-7. Diskette Options Submenu Options**

| Option                        | Function                                                                                                                                                                                             |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Floppy disk controller</b> | Configures diskette drive interface. Options are <b>Auto</b> , <b>Enabled</b> (default), and <b>Disabled</b> .                                                                                       |
| <b>Diskette A</b>             | Identifies the boot diskette drive in the computer. The default is <b>1.44/1.25 MB 31/2"</b> .                                                                                                       |
| <b>Diskette Write Protect</b> | Protects a diskette from being written to when set to <b>Enabled</b> . When this option is set to <b>Disabled</b> (default), the diskette is not protected unless the write-protect tab is in place. |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## DMI Event Logging Submenu

| Dell Dimension XPS R400 Setup |          |                 |               |                    |                        |                   |                   |
|-------------------------------|----------|-----------------|---------------|--------------------|------------------------|-------------------|-------------------|
| Advanced                      |          |                 |               |                    |                        |                   |                   |
| DMI Event Logging             |          |                 |               | Item Specific Help |                        |                   |                   |
| Event log capacity            |          | Space Available |               |                    |                        |                   |                   |
| Event log validity            |          | Valid           |               |                    |                        |                   |                   |
| View DMI Event Log            |          | [ Enter ]       |               |                    |                        |                   |                   |
| Clear all DMI event logs      |          | [ No ]          |               |                    |                        |                   |                   |
| Event logging                 |          | [ Enabled ]     |               |                    |                        |                   |                   |
| F1 Help                       | ESC Exit | ↑↓ Select Item  | ↔ Select Menu | -/+ Change Values  | Enter Select ► Submenu | F9 Setup Defaults | F10 Save and Exit |

**Figure B-7. DMI Event Logging Submenu**

**Table B-8. DMI Event Logging Submenu Options**

| Option                          | Function                                                                                                                                               |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Event log capacity</b>       | Displays information about the event log.                                                                                                              |
| <b>Event log validity</b>       | Displays <b>Invalid</b> if an error was detected in the event log.                                                                                     |
| <b>View DMI Event Log</b>       | Click <b>Enter</b> to view the DMI Event Log. To return to the <b>DMI Event Logging</b> submenu, click <b>Continue</b> in the <b>Event Log</b> window. |
| <b>Clear all DMI event logs</b> | Clears the DMI Event Log when the system restarts if set to <b>Yes</b> . Retains the event log information if set to <b>No</b> (default).              |
| <b>Event logging</b>            | Permits logging of DMI events. Set this option to <b>No</b> if no record of DMI events is desired.                                                     |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## Video Configuration Submenu

**Dell Dimension XPS R400 Setup**

**Advanced**

| Video Configuration                                                                                                                                                                                                                                                                  | Item Specific Help |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <p>Palette Snooping    [ Disabled ]</p> <p>AGP Aperture Size:   [ 64 MB ]</p>                                                                                                                                                                                                        |                    |
| <div style="display: flex; justify-content: space-between; font-size: small;"> <span>F1 Help<br/>ESC Exit</span> <span>↑↓ Select Item<br/>↔ Select Menu</span> <span>-/+ Change Values<br/>Enter Select ► Submenu</span> <span>F9 Setup Defaults<br/>F10 Save and Exit</span> </div> |                    |

**Figure B-8. Video Configuration Submenu**



**Table B-9. Video Configuration Submenu Options**

| Option                   | Function                                                                                                                                                                                                            |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Palette Snooping</b>  | Allows an ISA expansion card to check a PCI expansion card for an updated graphics palette. If this option is set to <b>Disabled</b> , the ISA expansion card may not be updated along with the PCI expansion card. |
| <b>AGP Aperture Size</b> | Sets the aperture size for the AGP video controller to <b>64 MB</b> (default) or <b>256 MB</b> .                                                                                                                    |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## Resource Configuration Submenu

| Dell Dimension XPS R400 Setup |                |                        |                   |
|-------------------------------|----------------|------------------------|-------------------|
| Advanced                      |                |                        |                   |
| Resource Configuration        |                | Item Specific Help     |                   |
| C800 - CBFF:                  | [ Available ]  |                        |                   |
| CC00 - CFFF:                  | [ Available ]  |                        |                   |
| D000 - D3FF:                  | [ Available ]  |                        |                   |
| D400 - D7FF:                  | [ Available ]  |                        |                   |
| D800 - DBFF:                  | [ Available ]  |                        |                   |
| DC00 - DFFF:                  | [ Available ]  |                        |                   |
| Memory Hole:                  | [ Disabled ]   |                        |                   |
| IRQ 3:                        | [ Available ]  |                        |                   |
| IRQ 4:                        | [ Available ]  |                        |                   |
| IRQ 5:                        | [ Available ]  |                        |                   |
| IRQ 7:                        | [ Available ]  |                        |                   |
| IRQ 10:                       | [ Available ]  |                        |                   |
| IRQ 11:                       | [ Available ]  |                        |                   |
| F1 Help                       | ↑↓ Select Item | -/+ Change Values      | F9 Setup Defaults |
| ESC Exit                      | ↔ Select Menu  | Enter Select ► Submenu | F10 Save and Exit |

**Figure B-9. Resource Configuration Submenu**

**Table B-10. Resource Configuration Submenu Options**

| Option             | Function                                                                                                                                                                                                                                                        |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XXXX-XXXX          | Reserves the specified UMB (for example <b>C800-CBFF</b> ) for use by legacy ISA devices. Settings are <b>Available</b> (default) and <b>Reserved</b> .                                                                                                         |
| <b>Memory Hole</b> | Settings are <b>Disabled</b> (default), <b>Conventional</b> , and <b>Extended</b> . <b>Conventional</b> turns system RAM off to free a 128-KB space, starting at 512 KB, for use with an expansion card. <b>Extended</b> frees a 1-MB space, starting at 15 MB. |
| <b>IRQ n</b>       | Reserves the specified IRQ for use by legacy ISA devices. Settings are <b>Available</b> (default) and <b>Reserved</b> .                                                                                                                                         |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## Security Screen

| Dell Dimension XPS R400 Setup |                |                        |                   |      |                    |
|-------------------------------|----------------|------------------------|-------------------|------|--------------------|
| Main                          | Advanced       | Security               | Power             | Boot | Exit               |
| Security                      |                |                        |                   |      | Item Specific Help |
| User Password Is:             |                |                        |                   |      | Not Installed      |
| Setup Password Is:            |                |                        |                   |      | Not Installed      |
| Setup User Password           |                |                        |                   |      | [ Enter ]          |
| Setup Setup Password          |                |                        |                   |      | [ Enter ]          |
| Clear User                    |                |                        |                   |      | [ Enter ]          |
| User Setup Access:            |                |                        |                   |      | [ Enabled ]        |
| Unattended Start              |                |                        |                   |      | [ Disabled ]       |
| F1 Help                       | ↑↓ Select Item | -/+ Change Values      | F9 Setup Defaults |      |                    |
| ESC Exit                      | ↔ Select Menu  | Enter Select ► Submenu | F10 Save and Exit |      |                    |

**Figure B-10. Security Screen Menu**

**Table B-11. Security Screen Menu Options**

| Option                    | Function                                                                                                                                                                                                              |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>User Password Is</b>   | Indicates whether a user password has been assigned.                                                                                                                                                                  |
| <b>Setup Password Is</b>  | Indicates whether a setup password has been assigned.                                                                                                                                                                 |
| <b>Set User Password</b>  | Allows you to assign, change, or clear a user password, which controls access to the computer at start-up.                                                                                                            |
| <b>Set Setup Password</b> | Allows assigning, changing, or clearing a setup password. The setup password provides access to both the computer and the system setup program.                                                                       |
| <b>Clear User</b>         | Clears the user password.                                                                                                                                                                                             |
| <b>User Setup Access</b>  | Controls user access to the system setup program. <b>Enabled</b> (default) allows user access. Set this option to <b>Disabled</b> to prevent user access to the system setup program.                                 |
| <b>Unattended Start</b>   | If this option is set to <b>Enabled</b> and a user password is set, the system boots normally, but the keyboard and the mouse are locked until the user password is entered. The default setting is <b>Disabled</b> . |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## Power Screen

| Dell Dimension XPS R400 Setup                                                                                                                                                                                                                                                                             |                                |                                             |                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------|----------------------------------------|
| Main                                                                                                                                                                                                                                                                                                      | Advanced                       | Security                                    | Power                                  |
| <div> <div> <div>Power Management:</div> <div>[ Enabled ]</div> </div> <div> <div>Inactivity Timer:</div> <div>[ Off ]</div> </div> <div> <div>Hard Drive:</div> <div>[ Enabled ]</div> </div> <div> <div>VESA Video Power Down:</div> <div>[ Enabled ]</div> </div> </div> <div>Item Specific Help</div> |                                |                                             |                                        |
| F1 Help<br>ESC Exit                                                                                                                                                                                                                                                                                       | ↑ Select Item<br>↔ Select Menu | -/+ Change Values<br>Enter Select ► Submenu | F9 Setup Defaults<br>F10 Save and Exit |

**Figure B-11. Power Screen Menu**



**Table B-12. Power Screen Menu Options**

| Option                       | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power Management</b>      | Enables or disables <b>Inactivity Timer</b> and <b>Hard Drive</b> options.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Inactivity Timer</b>      | <p>Determines the period of system inactivity (between 1 and 120 minutes) before certain system components enter a low-power mode. To disable power management, leave this option set to <b>Off</b> (default).</p> <p><i>NOTE: Leave this option set to <b>Off</b> if your operating system has power management controls.</i></p>                                                                                                                                                                                                                                                                                                                                               |
| <b>Hard Drive</b>            | <p>When set to <b>Enabled</b> (default), <b>Hard Drive</b> allows most EIDE hard-disk drives to automatically switch into low-power mode after a specified period of system inactivity (called a <i>time-out</i>). The time-out period is set with the <b>Inactivity Timer</b> option. When <b>Hard Drive</b> is set to <b>Disabled</b>, hard-disk drives do not switch into low-power mode.</p>                                                                                                                                                                                                                                                                                 |
| <b>VESA Video Power Down</b> | <p><i>NOTES: For the Windows 98 operating system, use the <b>Display</b> icon in the <b>Control Panel</b> to save monitor power rather than this option.</i></p> <p><i>This option is available only if the installed video card supports this feature.</i></p> <p><b>CAUTION: Before enabling this option, check the monitor documentation to make sure that the monitor is DPMS-compliant; otherwise, there is a risk of damaging the monitor.</b></p> <p>This option selects a VESA® power management mode for the monitor during periods of system inactivity. Settings for this option are <b>Disabled</b>, <b>Standby</b> (default), <b>Suspend</b>, and <b>Sleep</b>.</p> |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## Boot Screen

| Dell Dimension XPS R400 Setup                                                                                                                                                                                                                                                                                |                |                        |                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------|-------------------|
| Main                                                                                                                                                                                                                                                                                                         | Advanced       | Security               | Power Boot Exit   |
| Quiet Boot: [ Enabled ]<br>QuickBoot Mode: [ Disabled ]<br>After Power Failure: [ Power On ]<br><br>First Boot Device [ Removable Devices ]<br>Second Boot Device [ Hard Drive ]<br>Third Boot Device [ ATAPI CD-ROM Drive ]<br>Fourth Boot Device [ Network Boot ]<br><br>►Hard Drive<br>►Removable Devices |                | Item Specific Help     |                   |
| F1 Help                                                                                                                                                                                                                                                                                                      | ↑↓ Select Item | -/+ Change Values      | F9 Setup Defaults |
| ESC Exit                                                                                                                                                                                                                                                                                                     | ↔ Select Menu  | Enter Select ► Submenu | F10 Save and Exit |

**Figure B-12. Boot Screen Menu**

### Table B-13. Boot Screen Menu Options

| Option                     | Function                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>QuietBoot Mode</b>      | <b>Enabled</b> (default) eliminates the display of normal POST and sizing information. <b>Disabled</b> causes all information to be displayed and a single beep (POST beep) to be heard.                                                                                                                                                                                                                                                      |
| <b>QuickBoot Mode</b>      | When set to <b>Enabled</b> , this option shortens POST by eliminating some tests. If set to <b>Disabled</b> (default), all POST tests occur.                                                                                                                                                                                                                                                                                                  |
| <b>After Power Failure</b> | Determines what state the system enters when AC power is restored after a power loss. Settings are: <ul style="list-style-type: none"> <li>• <b>Last State</b> — System returns to the state it was in when power was lost.</li> <li>• <b>Stay Off</b> — System stays off when power is restored; you must press the power button to restore power.</li> <li>• <b>Power On</b> (default) — System turns on when power is restored.</li> </ul> |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

**Table B-13. Boot Screen Menu Options** (continued)

| Option                    | Function                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>First Boot Device</b>  | <p>Determines which device the system tries to boot from first. Use the up- or down-arrow key to highlight a device, and press the plus (+) or minus (–) key to move the item up or down the list. Settings for this option are:</p> <ul style="list-style-type: none"><li>• <b>Removable Devices</b> (default) — Normally diskette drive A</li><li>• <b>Hard Drive</b> — Hard-disk drive connected to primary EIDE channel</li><li>• <b>ATAPI CD-ROM Drive</b> — CD-ROM drive</li><li>• <b>Network Boot</b> — Drive on the network server</li></ul> |
| <b>Second Boot Device</b> | <p>Determines which device the system tries to boot from if it cannot boot from the device selected for <b>First Boot Device</b>. Settings for this option are the same as for <b>First Boot Device</b>.</p>                                                                                                                                                                                                                                                                                                                                         |
| <b>Third Boot Device</b>  | <p>Determines which device the system tries to boot from if it cannot boot from the devices selected for <b>First Boot Device</b> and <b>Second Boot Device</b>. Settings for this option are the same as for <b>First Boot Device</b>.</p>                                                                                                                                                                                                                                                                                                          |
| <b>Fourth Boot Device</b> | <p>Determines which device the system tries to boot from if it cannot boot from the devices selected for <b>First Boot Device</b>, <b>Second Boot Device</b>, and <b>Third Boot Device</b>. Settings for this option are the same as for <b>First Boot Device</b>.</p>                                                                                                                                                                                                                                                                               |
| <b>Hard Drive</b>         | <p>Displays order of bootable hard-disk drives. Refer to “Hard Drive Submenu” found next in this appendix.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Removable Devices</b>  | <p>Displays a list of removable devices. Refer to “Removable Devices Submenu” found later in this appendix.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                      |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.



## Hard Drive Submenu

| Dell Dimension XPS R400 Setup                        |      |                |       |                    |                   |
|------------------------------------------------------|------|----------------|-------|--------------------|-------------------|
|                                                      |      |                | Boot  |                    |                   |
| Hard Drive                                           |      |                |       | Item Specific Help |                   |
| 1. [ IBM-DHEA-38451 ]<br>2. [ Bootable Add-In Card ] |      |                |       |                    |                   |
| F1                                                   | Help | ↑↓ Select Item | -/+   | Change Values      | F9 Setup Defaults |
| ESC                                                  | Exit | ↔ Select Menu  | Enter | Select ► Submenu   | F10 Save and Exit |

**Figure B-13. Hard Drive Submenu**

**Table B-14. Hard Drive Submenu Options**

| Option                      | Function                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>device designation</i>   | The computer system attempts to boot the operating system from the first device listed. To select a new boot device, reorder the list: Use the up- or down-arrow key to highlight a device, and press the plus (+) or minus (-) key to move the item up or down the list. If no operating system is found on the boot device, the system attempts to boot from each successive device until an operating system is found. |
| <b>Bootable Add-In Card</b> | Same as preceding item.                                                                                                                                                                                                                                                                                                                                                                                                   |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*

## Removable Devices Submenu

| Dell Dimension XPS R400 Setup |      |                    |                        |
|-------------------------------|------|--------------------|------------------------|
|                               |      | Boot               |                        |
| Removable Devices             |      | Item Specific Help |                        |
| 1. [ Legacy Floppy Drives ]   |      |                    |                        |
| F1                            | Help | ↑↓ Select Item     | —/+ Change Values      |
| ESC                           | Exit | ↔ Select Menu      | Enter Select ► Submenu |
|                               |      | F9                 | Setup Defaults         |
|                               |      | F10                | Save and Exit          |

**Figure B-14. Removable Devices Submenu**

**Table B-15. Removable Devices Submenu Option**

| Option                      | Function                                                                                                                                                                                                                                                                                                            |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Legacy Floppy Drives</b> | The operating system assigns drive letters to removable devices in the order listed on the <b>Removable Devices</b> submenu. To change the drive designations, reorder the list: Use the up- or down-arrow key to highlight a device, and press the plus (+) or minus (–) key to move the item up or down the list. |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## Exit Screen

| Dell Dimension XPS R400 Setup                                                                                                                                                            |                |                        |                   |      |                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------|-------------------|------|--------------------|
| Main                                                                                                                                                                                     | Advanced       | Security               | Power             | Boot | Exit               |
| Exit Saving Changes [Enter]<br>Exit Discarding Changes [Enter]<br>Load Setup Defaults [Enter]<br>Load Custom Defaults [Enter]<br>Save Custom Defaults [Enter]<br>Discard Changes [Enter] |                |                        |                   |      | Item Specific Help |
| F1 Help                                                                                                                                                                                  | ↑↓ Select Item | -/+ Change Values      | F9 Setup Defaults |      |                    |
| ESC Exit                                                                                                                                                                                 | ↔ Select Menu  | Enter Select ► Submenu | F10 Save and Exit |      |                    |

**Figure B-15. Exit Screen Menu**

**Table B-16. Exit Screen Menu Options**

| Option                         | Function                                                                                                                                                                                      |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Exit Saving Changes</b>     | Saves any changes you have made, exits the system setup program, and restarts the system.                                                                                                     |
| <b>Exit Discarding Changes</b> | Discards any changes you have made, exits the system setup program, and restarts the system.                                                                                                  |
| <b>Load Setup Defaults</b>     | Discards any changes you have made and reverts all options to their original default settings, but does not exit the system setup program.                                                    |
| <b>Load Custom Defaults</b>    | Loads settings saved using <b>Save Custom Defaults</b> option. Press <Enter>. Then press spacebar to select <b>Yes</b> or <b>No</b> at the confirmation pop-up menu, and press <Enter> again. |
| <b>Save Custom Defaults</b>    | Saves any changes you have made, but does not exit the system setup program.                                                                                                                  |
| <b>Discard Changes</b>         | Discards any changes you have made and reverts all options to their last saved settings, but does not exit the system setup program.                                                          |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.



## Disabling a Forgotten Password

If you forget your user or setup password, you will be unable to operate your system or change settings in the system setup program, respectively, until you disable the existing password(s). Disabling the password(s) involves removing the computer cover and changing a jumper setting (twice) on the system board.



*NOTE: You disable both user and setup passwords at the same time.*



**CAUTION:** This procedure requires entering Maintenance mode, which returns all options in the system setup program to their default settings. Dell strongly recommends that you record or print all current settings before entering Maintenance mode so that you can correct them when the system is reset to Normal mode.

To disable a forgotten password, perform the following steps:

1. Remove the computer cover and support beam as described in "Removing and Replacing the Computer Cover and Support Beam" in Chapter 2.
2. Refer to Figure 2-5 and Table 2-2 for the location and settings of the configuration jumper (J8A1) on the system board.
3. Move the jumper plug to the Maintenance mode setting (pins 2 and 3 jumpered).
4. Replace the computer cover and support beam; reconnect your computer to an electrical outlet and turn it on.

The system boots directly into the **Maintenance** screen of the system setup program.

5. At the **Maintenance** screen, highlight **Clear All Passwords**, press <Enter>, and then click **Yes** to erase all existing passwords.
6. Reset **Processor Speed** to match your system's processor speed.



**CAUTION:** Never set Processor Speed higher than the speed of the installed microprocessor. Operating the system with a higher setting (for example, running a 350-MHz system with Processor Speed set to 400 MHz) can damage the microprocessor.

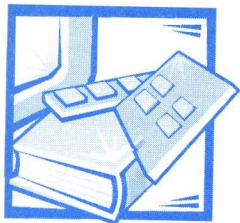
7. Press <F10> to save your changes and exit the system setup program.
8. Turn off the system, and remove the computer cover and support beam.
9. Move the jumper plug back to the Normal mode setting (pins 1 and 2 jumpered).
10. Replace the computer cover and support beam; reconnect the computer and devices to electrical outlets and turn them on.
11. Assign a new user and/or setup password on the **Security** screen of the system setup program.

For information on assigning a new user and/or setup password, refer to Table B-11.

## Clearing NVRAM

To clear NVRAM for all devices and restart the system, follow these steps:

1. Enter the system setup program as described at the beginning of this appendix.
2. Press the right-arrow key to move to the **Advanced** menu.
3. Press the down-arrow key to highlight **Reset Configuration Data**. Then press the plus (+) key to change the setting to **Yes** (refer to Table B-3).
4. Press <F10> to exit the program and reboot the system.



## APPENDIX C

# Beep Codes and System Messages

Your application programs, the operating system, and the computer itself can provide you with error and status information in the form of beep codes that sound through the computer's speaker or messages that appear on the monitor screen. This appendix documents the beep codes and system messages generated by the system basic input/output system (BIOS). For other messages, refer to the documentation for your application program or operating system.

### POST Beep Codes

If the monitor cannot display errors or problems, during power-on self-test (POST) the computer may emit a series of beeps, or *beep code*, that identifies the problem. For example, one beep, a burst of three short beeps, and two more single beeps (beep code 1-3-1-1) means that the system has encountered a dynamic random-access memory (DRAM) refresh error condition.

If the system emits a beep code and then fails to boot, write down the beep code and look it up in Table C-1.

**Table C-1. POST Beep Codes**

| Beep Code | Possible Cause          | Corrective Action                                                                       |
|-----------|-------------------------|-----------------------------------------------------------------------------------------|
| 1-2       | Video card not present  | Reseat the video card as described in "Expansion Cards" in Chapter 6.                   |
| 1-2-2-3   | BIOS ROM checksum error | Refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance. |
| 1-3-1-1   | DRAM refresh error      | Reseat the DIMMs as described in "Reseating DIMMs" in Chapter 6.                        |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*



**Table C-1. POST Beep Codes** (continued)

| Beep Code | Possible Cause                                          | Corrective Action                                                                                                                                      |
|-----------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1-3-1-3   | 8742 keyboard controller error                          | Reseat the keyboard connector.<br><br>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance. |
| 1-3-3-1   | Memory defective or not present                         | Reseat the DIMMs as described in "Reseating DIMMs" in Chapter 6.                                                                                       |
| 1-3-4-1   | RAM failure on line xxx                                 | Reseat the DIMMs as described in "Reseating DIMMs" in Chapter 6.                                                                                       |
| 1-3-4-3   | RAM failure on data bits xxx of low byte on memory bus  | Reseat the DIMMs as described in "Reseating DIMMs" in Chapter 6.                                                                                       |
| 1-4-1-1   | RAM failure on data bits xxx of high byte on memory bus | Reseat the DIMMs as described in "Reseating DIMMs" in Chapter 6.                                                                                       |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

## System Messages

The first column in Table C-2 lists (in alphabetical order) system messages that may appear on the screen during the boot routine or during normal system operation. The second column in the table lists probable causes of the messages, and the third column either provides a corrective action or refers you to a source for resolving the problem.

**Table C-2. System Messages**

| Message                  | Possible Cause                                            | Corrective Action       |
|--------------------------|-----------------------------------------------------------|-------------------------|
| nnnn Cache RAM Passed    | nnnn KB of system cache RAM has been successfully tested. | No action is necessary. |
| nnnn Extended RAM Passed | nnnn KB of system RAM has been successfully tested.       | No action is necessary. |
| nnnn Shadow RAM Passed   | nnnn KB of shadow RAM has been successfully tested.       | No action is necessary. |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

**Table C-2. System Messages** (continued)

| Message                                                          | Possible Cause                                                                                                                                                       | Corrective Action                                                                                                                                                                                                                                                 |
|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>nnnn</i> System RAM Passed                                    | <i>nnnn</i> KB of system RAM has been successfully tested.                                                                                                           | No action is necessary.                                                                                                                                                                                                                                           |
| CD ROM drive Identified                                          | The system's automatic drive-type detection feature has identified the CD-ROM drive.                                                                                 | No action is necessary.                                                                                                                                                                                                                                           |
| Diskette drive A error<br><br>Diskette drive B error             | Drive A or B is present but has failed the BIOS POST.                                                                                                                | Ensure that the drive is installed correctly in the chassis and defined correctly in the system setup program.                                                                                                                                                    |
| Entering Setup                                                   | The system is starting the system setup program.                                                                                                                     | No action is necessary.                                                                                                                                                                                                                                           |
| Extended RAM Failed at offset: <i>nnnn</i>                       | Extended memory is not working correctly or is not configured correctly at offset <i>nnnn</i> .                                                                      | <p>If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).</p> <p>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.</p> |
| Failing Bits: <i>nnnn</i>                                        | <i>nnnn</i> is a map of the bits at the RAM address (in system, extended, or shadow memory) that failed the memory test. Each "1" in the map indicates a failed bit. | <p>If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).</p> <p>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.</p> |
| Fixed Disk <i>n</i> Failure<br><br>Fixed Disk Controller Failure | The hard-disk drive specified by <i>n</i> is not working or is not configured correctly.                                                                             | <p>Ensure that the drive is installed correctly in the chassis and defined correctly in the system setup program.</p> <p>If the problem persists, refer to "Hard-Disk Drive" in Chapter 6.</p>                                                                    |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

**Table C-2. System Messages (continued)**

| Message                                         | Possible Cause                                                                                                   | Corrective Action                                                                                                                                                                                                                                                                                                        |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fixed Disk <i>n</i><br>Identified               | The system's automatic drive-type detection feature has identified the hard-disk drive(s).                       | No action is necessary.                                                                                                                                                                                                                                                                                                  |
| Incorrect<br>Drive <i>x</i> type<br>- Run SETUP | Diskette drive <i>x</i> is not correctly identified in the system setup program.                                 | Ensure that the drive is defined correctly in the system setup program.                                                                                                                                                                                                                                                  |
| Invalid NVRAM<br>media type                     | The system is having a problem accessing NVRAM.                                                                  | Set the configuration jumper to Maintenance mode (refer to Table 2-2), and reboot the system to return all settings to their defaults. If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.                                                                  |
| Invalid<br>system con-<br>figuration<br>data    | The system configuration information in the system setup program is incorrect, or the battery charge may be low. | Enter the system setup program, and verify the system configuration information; then reboot the computer. If the problem persists, refer to "Replacing the System Battery" in Chapter 2. If neither action provides a solution, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance. |
| Keyboard con-<br>troller error                  | The keyboard controller failed its test.                                                                         | <p>If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).</p> <p>If the problem persists, you may have to replace the keyboard or system board. Refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.</p>  |
| Keyboard<br>error                               | The keyboard is not working correctly.                                                                           | You may have to replace the keyboard or system board. Refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.                                                                                                                                                                            |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.



**Table C-2. System Messages** (continued)

| Message                             | Possible Cause                                                                                                                                                                                | Corrective Action                                                                                                                                                                                                                                                                                             |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Keyboard error <i>nn</i>            | The BIOS has detected a stuck key represented by scan code <i>nn</i> .                                                                                                                        | Make sure nothing is resting on the keyboard; if a key appears to be stuck, carefully try to pry it up.<br><br>If the problem persists and/or you cannot locate the stuck key, you may need to replace your keyboard. Refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance. |
| Mouse initialized                   | The system's mouse has been found and initialized.                                                                                                                                            | No action is necessary.                                                                                                                                                                                                                                                                                       |
| Operating system not found          | The operating system cannot be located on drive A or drive C.                                                                                                                                 | Enter the system setup program and confirm that drive A or drive C is properly identified.                                                                                                                                                                                                                    |
| Parity check 1 <i>nnnn</i>          | A parity error has been detected on the system bus. The BIOS attempts to locate the address and display it ( <i>nnnn</i> ); if it cannot locate the address, it displays <i>????</i> instead. | If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).<br><br>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.                                                    |
| Parity check 2 <i>nnnn</i>          | A parity error has been detected on the I/O bus. The BIOS attempts to locate the address and display it ( <i>nnnn</i> ); if it cannot locate the address, it displays <i>????</i> instead.    | If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).<br><br>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.                                                    |
| Press <F1> to resume, <F2> to Setup | This message is displayed after any recoverable error message.                                                                                                                                | Press <F1> to start the boot routine or <F2> to enter the system setup program and change any settings.                                                                                                                                                                                                       |
| Press <Del> to enter SETUP          | Optional message displayed during POST.                                                                                                                                                       | If desired, press <Del> to enter the system setup program.                                                                                                                                                                                                                                                    |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

**Table C-2. System Messages** (continued)

| Message                                               | Possible Cause                                                                                                                                                                   | Corrective Action                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Previous boot incomplete - Default configuration used | After an unsuccessful boot, POST loads default values and offers to run the system setup program. (POST does <i>not</i> input these default values to the system setup program.) | There may be incorrect values or settings in the system setup program. Run the system setup program and attempt to restore the correct setting(s). If the message reappears, set the configuration jumper to Maintenance mode (refer to Table 2-2), and boot the system to return all settings to their defaults.                                               |
| Real time clock error                                 | The RTC has failed the BIOS test.                                                                                                                                                | <p>If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).</p> <p>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.</p>                                                                                               |
| Resource allocation conflict on motherboard           | The system cannot configure all system board devices without a resource conflict.                                                                                                | Run the system setup program and try to resolve any obvious resource conflicts. If the message reappears, set the configuration jumper to Maintenance mode (refer to Table 2-2), and boot the system to return all settings to their defaults. If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance. |
| Shadow RAM failed at offset: <i>nnnn</i>              | Shadow RAM has failed at offset <i>nnnn</i> in the 64-KB block in which the error was detected.                                                                                  | <p>If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).</p> <p>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.</p>                                                                                               |
| System battery is dead - Replace and run SETUP        | The CMOS clock battery indicator shows the battery is dead.                                                                                                                      | Replace the battery, and run the system setup program to reconfigure the system.                                                                                                                                                                                                                                                                                |

NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.

**Table C-2. System Messages** (continued)

| Message                                  | Possible Cause                                                                                                              | Corrective Action                                                                                                                                                                                                                                                 |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| System BIOS shadowed                     | The system BIOS has been copied to shadow RAM.                                                                              | No action is necessary.                                                                                                                                                                                                                                           |
| System cache error - cache disabled      | RAM cache failed the BIOS test; the BIOS has disabled the cache.                                                            | <p>If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).</p> <p>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.</p> |
| System CMOS checksum bad - run SETUP     | System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. | Run the system setup program and reconfigure the system by either reverting to the default values or making your own selections.                                                                                                                                  |
| System RAM failed at offset: <i>nnnn</i> | System RAM failed at offset <i>nnnn</i> in the 64-KB block in which the error was detected.                                 | <p>If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).</p> <p>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.</p> |
| System timer error                       | The timer test failed.                                                                                                      | <p>If you receive this message after making changes in the system setup program, enter the program and restore the original value(s).</p> <p>If the problem persists, refer to Chapter 8, "Getting Help," for instructions on obtaining technical assistance.</p> |

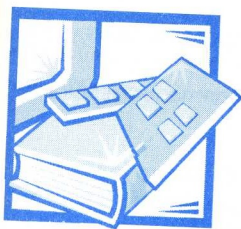
NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.



**Table C-2. System Messages** (continued)

| Message                                          | Possible Cause                                                                                                                                                          | Corrective Action       |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| UMB upper<br>limit seg-<br>ment address:<br>nnnn | Displays the address<br>nnnn of the upper limit<br>of the UMB, indicating<br>released segments of<br>the BIOS which may be<br>reclaimed by a virtual<br>memory manager. | No action is necessary. |
| Video BIOS<br>shadowed                           | The video BIOS has<br>been successfully cop-<br>ied to shadow RAM.                                                                                                      | No action is necessary. |

*NOTE: The Glossary in the Online Guide defines abbreviations and acronyms.*



## APPENDIX D

### Regulatory Notices

Electromagnetic Interference (EMI) is any signal or emission, radiated in free space or conducted along power or signal leads, that endangers the functioning of a radio navigation or other safety service or seriously degrades, obstructs, or repeatedly interrupts a licensed radio communications service. Radio communications services include but are not limited to AM/FM commercial broadcast, television, cellular services, radar, air-traffic control, pager, and Personal Communication Services (PCS). These licensed services, along with unintentional radiators such as digital devices, including computer systems, contribute to the electromagnetic environment.

Electromagnetic Compatibility (EMC) is the ability of items of electronic equipment to function properly together in the electronic environment. While this computer system has been designed and determined to be compliant with regulatory agency limits for EMI, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference with radio communications services, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that the computer and the receiver are on different branch circuits.

If necessary, consult a Regulatory EMC representative of Dell Computer Corporation or an experienced radio/television technician for additional suggestions. You may find the *FCC Interference Handbook, 1986*, to be helpful. It is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00450-7 or on the World Wide Web at <http://www.fcc.gov/Bureaus/Compliance/WWW/tvibook.html>.

Dell computer systems are designed, tested, and classified for their intended electromagnetic environment. These electromagnetic environment classifications generally refer to the following harmonized definitions:

- Class A is for business or industrial environments.
- Class B is for residential environments.

Information Technology Equipment (ITE), including peripherals, expansion cards, printers, input/output (I/O) devices, monitors, and so on, that are integrated into or connected to the system should match the electromagnetic environment classification of the computer system.

**A Notice About Shielded Signal Cables: Use only shielded cables for connecting peripherals to any Dell device to reduce the possibility of interference with radio communications services. Using shielded cables ensures that you maintain the appropriate EMC classification for the intended environment. For parallel printers, a cable is available from Dell Computer Corporation. If you prefer, you can order a cable from Dell Computer Corporation on the World Wide Web at <http://www.dell.com/products/dellware/index.htm>.**

Most Dell computer systems are classified for Class B environments. To determine the electromagnetic classification for your system or device, refer to the following sections specific for each regulatory agency. Each section provides country-specific EMC/EMI or product safety information.

## **FCC Notices (U.S. Only)**

Most Dell computer systems are classified by the Federal Communications Commission (FCC) as Class B digital devices. However, the inclusion of certain options can change the rating of some configurations to Class A. To determine which classification applies to your computer system, examine all FCC registration labels located on the bottom or back panel of your computer, on card-mounting brackets, and on the cards themselves. If any one of the labels carries a Class A rating, your entire system is considered to be a Class A digital device. If *all* labels carry either the Class B rating distinguished by either an FCC ID number or the FCC logo, (FCC), your system is considered to be a Class B digital device.

Once you have determined your system's FCC classification, read the appropriate FCC notice. Note that FCC regulations provide that changes or modifications not expressly approved by Dell Computer Corporation could void your authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

## **Class A**

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio



frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause harmful interference with radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

## **Class B**

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

The following information is provided on the device or devices covered in this document in compliance with FCC regulations:

- Product name: Dell Dimension XPS Rxxx
- Model number: MMS
- Company name: Dell Computer Corporation  
EMC Engineering Department  
One Dell Way  
Round Rock, Texas 78682 USA  
512-338-4400

## IC Notice (Canada Only)

Most Dell computer systems (and other Dell digital apparatus) are classified by the Industry Canada (IC) Interference-Causing Equipment Standard #3 (ICES-003) as Class B digital devices. To determine which classification (Class A or B) applies to your computer system (or other Dell digital apparatus), examine all registration labels located on the bottom or the back panel of your computer (or other digital apparatus). A statement in the form of "IC Class A ICES-3" or "IC Class B ICES-3" will be located on one of these labels. Note that Industry Canada regulations provide that changes or modifications not expressly approved by Dell Computer Corporation could void your authority to operate this equipment.

This Class B (or Class A, if so indicated on the registration label) digital apparatus meets the requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe B (ou Classe A, si ainsi indiqué sur l'étiquette d'enregistrement) respecte toutes les exigences du Règlement sur le Matériel Brouilleur du Canada.

## CE Notice (European Union)

Marking by the symbol **CE** indicates compliance of this Dell system to the EMC Directive and the Low Voltage Directive of the European Union. Such marking is indicative that this Dell system meets the following technical standards:

- EN 55022 — "Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equipment."
- EN 50082-1: 1992 — "Electromagnetic compatibility—Generic immunity standard Part 1: Residential, commercial, and light industry."
- EN 60950 — "Safety of Information Technology Equipment."



*NOTE: EN 55022 emissions requirements provide for two classifications:*

- *Class A is for typical commercial areas.*
- *Class B is for typical domestic areas.*

This Dell device is classified for use in a typical Class B domestic environment.

A "Declaration of Conformity" in accordance with the preceding directives and standards has been made and is on file at Dell Products Europe BV, Limerick, Ireland.

## **EN 55022 Compliance (Czech Republic Only)**

This device belongs to Class B devices as described in EN 55022, unless it is specifically stated that it is a Class A device on the specification label. The following applies to devices in Class A of EN 55022 (radius of protection up to 30 meters). The user of the device is obliged to take all steps necessary to remove sources of interference to telecommunication or other devices.

Pokud není na typovém štítku počítače uvedeno, že spadá do třídy A podle EN 55022, spadá automaticky do třídy B podle EN 55022. Pro zařízení zařazená do třídy A (ochranné pásmo 30m) podle EN 55022 platí následující. Dojde-li k rušení telekomunikačních nebo jiných zařízení, je uživatel povinen provést taková opatření, aby rušení odstranil.

## **VCCI Notice (Japan Only)**

Most Dell computer systems are classified by the Voluntary Control Council for Interference (VCCI) as Class B information technology equipment (ITE). However, the inclusion of certain options can change the rating of some configurations to Class A. ITE, including peripherals, expansion cards, printers, input/output (I/O) devices, monitors, and so on, integrated into or connected to the system, should match the electromagnetic environment classification (Class A or B) of the computer system.

To determine which classification applies to your computer system, examine the regulatory labels/markings (see Figures D-1 and D-2) located on the bottom or back panel of your computer. Once you have determined your system's VCCI classification, read the appropriate VCCI notice.

### **Class A ITE**

この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) for information technology equipment. If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.



# VCCI-A

**Figure D-1. VCCI Class A ITE Regulatory Mark**

## Class B ITE

この装置は、情報処理装置等電波障害自主規制協議会 (VCCI) の基準に基づくクラス B 情報技術装置です。この装置は家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用させると、受信障害を引き起こすことがあります。  
取扱説明書に従って正しい取り扱いをして下さい。

This is a Class B product based on the standard of the Voluntary Control Council for Interference (VCCI) for information technology equipment. If this equipment is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.



**Figure D-2. VCCI Class B ITE Regulatory Mark**

## **NOM Information (Mexico Only)**

The following information is provided on the device(s) described in this document in compliance with the requirements of the official Mexican standards (NOM)

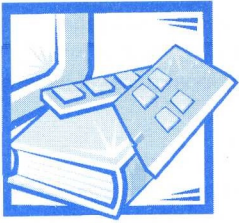
|                         |                                                                                                                                                                           |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exporter:               | Dell Computer Corporation<br>One Dell Way<br>Round Rock, TX 78682                                                                                                         |
| Importer:               | Dell Computer de México,<br>S.A. de C.V.<br>Rio Lerma No. 302 - 4° Piso<br>Col. Cuauhtemoc<br>16500 México, D.F.                                                          |
| Ship to:                | Dell Computer de México,<br>S.A. de C.V. al Cuidado<br>de Kuehne & Nagel de<br>México S. de R.L.<br>Avenida Soles No. 55<br>Col. Peñon de los Baños<br>15520 México, D.F. |
| Supply voltage:         | 115/230 VAC                                                                                                                                                               |
| Frequency:              | 60/50 Hz                                                                                                                                                                  |
| Current<br>consumption: | 6.0/3.0 A                                                                                                                                                                 |

## **Información para NOM (únicamente para México)**

La información siguiente se proporciona en el dispositivo o en los dispositivos descritos en este documento, en cumplimiento con los requisitos de la Norma Oficial Mexicana (NOM):

|                          |                                                                                                                                                                           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exportador:              | Dell Computer Corporation<br>One Dell Way<br>Round Rock, TX 78682                                                                                                         |
| Importador:              | Dell Computer de México,<br>S.A. de C.V.<br>Rio Lerma No. 302 - 4° Piso<br>Col. Cuauhtemoc<br>16500 México, D.F.                                                          |
| Embarcar a:              | Dell Computer de México,<br>S.A. de C.V. al Cuidado<br>de Kuehne & Nagel de<br>México S. de R.L.<br>Avenida Soles No. 55<br>Col. Peñon de los Baños<br>15520 México, D.F. |
| Tensión<br>alimentación: | 115/230 VAC                                                                                                                                                               |
| Frecuencia:              | 60/50 Hz                                                                                                                                                                  |
| Consumo de<br>corriente: | 6.0/3.0 A                                                                                                                                                                 |





## **APPENDIX E**

# **Warranty, Return Policy, and Year 2000 Statement of Compliance**

### **Limited Three-Year Warranty (U.S. and Canada Only)**

Dell Computer Corporation ("Dell") manufactures its hardware products from parts and components that are new or equivalent to new in accordance with industry-standard practices. Dell warrants that the hardware products it manufactures will be free from defects in materials and workmanship. The warranty term is three years beginning on the date of invoice, as described in the following text.

Damage due to shipping the products to you is covered under this warranty. Otherwise, this warranty does not cover damage due to external causes, including accident, abuse, misuse, problems with electrical power, servicing not authorized by Dell, usage not in accordance with product instructions, failure to perform required preventive maintenance, and problems caused by use of parts and components not supplied by Dell.

This warranty does not cover any items that are in one or more of the following categories: software; external devices (except as specifically noted); accessories or parts added to a Dell system after the system is shipped from Dell; accessories or parts added to a Dell system through Dell's system integration department; accessories or parts that are not installed in the Dell factory; or DellWare® products. Monitors, keyboards, and mice that are Dell-branded or that are included on Dell's standard price list are covered under this warranty; all other monitors, keyboards, and mice (including those sold through the DellWare program) are not covered. Batteries for portable computers are covered only during the initial one-year period of this warranty.

### **Coverage During Year One**

During the one-year period beginning on the invoice date, Dell will repair or replace products covered under this limited warranty that are returned to Dell's facility. To request warranty service, you must call Dell's Customer Technical Support within the warranty period. Refer to Chapter 8, "Getting Help," to find the appropriate telephone number for obtaining customer assistance. If warranty service is required, Dell will issue a Return Material Authorization Number. You must ship the products back to Dell in their original or equivalent packaging, prepay shipping charges, and insure the

shipment or accept the risk of loss or damage during shipment. Dell will ship the repaired or replacement products to you freight prepaid if you use an address in the continental U.S. or Canada, where applicable. Shipments to other locations will be made freight collect.



*NOTE: Before you ship the product(s) to Dell, back up the data on the hard-disk drive(s) and any other storage device(s) in the product(s). Remove any removable media, such as diskettes, CDs, or PC Cards. Dell does not accept liability for lost data or software.*

Dell owns all parts removed from repaired products. Dell uses new and reconditioned parts made by various manufacturers in performing warranty repairs and building replacement products. If Dell repairs or replaces a product, its warranty term is not extended.

## **Coverage During Years Two and Three**

During the second and third years of this limited warranty, Dell will provide, on an exchange basis and subject to Dell's Exchange Policy in effect on the date of the exchange, replacement parts for the Dell hardware product(s) covered under this limited warranty when a part requires replacement. You must report each instance of hardware failure to Dell's Customer Technical Support in advance to obtain Dell's concurrence that a part should be replaced and to have Dell ship the replacement part. Dell will ship parts (freight prepaid) if you use an address in the continental U.S. or Canada, where applicable. Shipments to other locations will be made freight collect. Dell will include a prepaid shipping container with each replacement part for your use in returning the replaced part to Dell. Replacement parts are new or reconditioned. Dell may provide replacement parts made by various manufacturers when supplying parts to you. The warranty term for a replacement part is the remainder of the limited warranty term.

You will pay Dell for replacement parts if the replaced part is not returned to Dell. The process for returning replaced parts, and your obligation to pay for replacement parts if you do not return the replaced parts to Dell, will be in accordance with Dell's Exchange Policy in effect on the date of the exchange.

You accept full responsibility for your software and data. Dell is not required to advise or remind you of appropriate backup and other procedures.

## **General Provisions**

DELL MAKES NO EXPRESS WARRANTIES OR CONDITIONS BEYOND THOSE STATED IN THIS WARRANTY STATEMENT. DELL DISCLAIMS ALL OTHER WARRANTIES AND CONDITIONS, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. SOME STATES (OR JURISDICTIONS) DO NOT ALLOW LIMITATIONS ON IMPLIED WARRANTIES OR CONDITIONS, SO THIS LIMITATION MAY NOT APPLY TO YOU.

DELL'S RESPONSIBILITY FOR MALFUNCTIONS AND DEFECTS IN HARDWARE IS LIMITED TO REPAIR AND REPLACEMENT AS SET FORTH IN THIS WARRANTY STATEMENT. THESE WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH VARY FROM STATE TO STATE (OR JURISDICTION TO JURISDICTION).



DELL DOES NOT ACCEPT LIABILITY BEYOND THE REMEDIES SET FORTH IN THIS WARRANTY STATEMENT OR LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION ANY LIABILITY FOR PRODUCTS NOT BEING AVAILABLE FOR USE OR FOR LOST DATA OR SOFTWARE.

SOME STATES (OR JURISDICTIONS) DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE PRECEDING EXCLUSION OR LIMITATION MAY NOT APPLY TO YOU.

These provisions apply to Dell's limited three-year warranty only. For provisions of any service contract covering your system, refer to your invoice or the separate service contract that you will receive.

If Dell elects to exchange a system or component, the exchange will be made in accordance with Dell's Exchange Policy in effect on the date of the exchange. In any instance in which Dell issues a Return Materials Authorization Number, Dell must receive the product(s) for repair prior to the expiration of the warranty period in order for the repair(s) to be covered by the warranty.



*NOTE: If you chose one of the available warranty and service options in place of the standard limited three-year warranty described in the preceding text, the option you chose will be listed on your invoice.*

## ***"Total Satisfaction" Return Policy (U.S. and Canada Only)***

If you are an end-user customer who bought new products directly from a Dell company, you may return them to Dell within 30 days of the date of invoice for a refund or credit of the product purchase price. If you are an end-user customer who bought reconditioned or refurbished products from a Dell company, you may return them to Dell within 14 days of the date of invoice for a refund or credit of the product purchase price. In either case, the refund or credit will not include any shipping and handling charges shown on your invoice. If you are an organization that bought the products under a written agreement with Dell, the agreement may contain different terms for the return of products than specified by this policy.

To return products, you must call Dell Customer Service to receive a Credit Return Authorization Number. Refer to Chapter 8, "Getting Help," to find the appropriate telephone number for obtaining customer assistance. To expedite the processing of your refund or credit, Dell expects you to return the products to Dell in their original packaging within five days of the date that Dell issues the Credit Return Authorization Number. You must also prepay shipping charges and insure the shipment or accept the risk of loss or damage during shipment. You may return software for refund or credit only if the sealed package containing the diskette(s) or CD(s) is unopened. Returned products must be in as-new condition, and all of the manuals, diskette(s), CD(s), power cables, and other items included with a product must be returned with it. For customers who want to return, for refund or credit only, either applications software or an operating system that has been installed by Dell, the whole system must be returned, along with any media and documentation that may have been included in the original shipment.



This "Total Satisfaction" Return Policy does not apply to DellWare products, which may be returned under DellWare's then-current return policy. In addition, reconditioned parts purchased through Dell Spare Parts Sales in Canada are nonreturnable.

## **Year 2000 Statement of Compliance for Dell-Branded Hardware Products**

Dell-branded hardware products shipped on or after January 1, 1997, are eligible to carry the "NSTL Hardware Tested Year 2000 Compliant" logo by virtue of formal testing with, and successful completion of, the National Software Testing Laboratories (NSTL) YMARK2000 test.\* Dell will treat a failure to pass the YMARK2000 test as a covered event under Dell's warranty for the product, subject to the normal warranty limitations.\*\* For a complete copy of Dell's warranty, see the product's documentation. Dell-branded hardware products will also recognize the year 2000 as a leap year.

\*The YMARK2000 standard tests the ability of system hardware and firmware to support the transition to the year 2000 (and to recognize leap years, when appropriate, for years 2000 through 2009 inclusive) and not that of options, operating systems, or applications software. Dell-branded hardware products that pass the YMARK2000 test conform to BSI-DISC PD 2000-1.

\*\* Except for this clarification of Dell's warranty for NSTL logo hardware, all other warranties, conditions and remedies, express or implied, relating to year 2000 readiness or compliance are disclaimed. To make a claim under this warranty for NSTL logo hardware, customers must contact Dell prior to January 1, 2001. Despite a system's ability to pass the YMARK2000 test, actual rollover results in specific operating environments may vary depending on other factors including, but not limited to, other hardware, operating systems, and applications software.

### **Previous Products**

For Dell-branded hardware products shipped prior to January 1, 1997, that have an upgradable basic input/output system (BIOS), Dell makes available a BIOS upgrade. Although these products may not have been tested under the YMARK2000 test, Dell believes that the hardware would pass the YMARK2000 test, provided the appropriate BIOS upgrade is properly loaded.

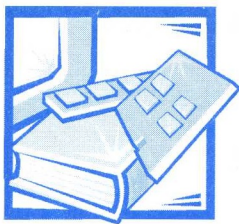
For Dell-branded hardware products that do not have an upgradable BIOS, Dell has made available, as a convenience to customers, the Dell Program Patch, a software utility designed to assist customers in managing the year 2000 rollover.

### **Software**

Dell specifically excludes all non-Dell-developed software from this compliance statement. All software run on Dell-branded hardware products should be independently verified by customers to be year 2000-compliant.

### **Additional Information**

For additional information on year 2000 compliance of Dell-branded hardware products, refer to Dell's Year 2000 Web site at [www.dell.com/year2000](http://www.dell.com/year2000) or contact a Dell customer service representative in your area.



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